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Nozick on rights and minimal state

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This paper attempts to examine the arguments put forward by Robert Nozick in his *Anarchy, State and Utopia* for the claim

> [that] a minimal state limted to the narrow functions of protection against force, theft, fraud, enforcement of contracts, and so on, is justified, that any more extensive state will violate persons' rights not to be forced to do certain things, and is unjustified; and that the minimal state is inspiring as well as right (1974, ix).

I

Nozick's arguments in support of his claim depend on his views on what the rights of persons are. For him rights are side-constraints on actions. He makes a distinction between 'incorporating rights into the end state to be achieved' and placing them 'as side-constraints upon the actions to be done'. An example of the former will be: minimize the total amount of violations of rights. The example of the later will be : do not violate constraints *c*. According to Nozick:

> The side-constraint view forbids you to violate these moral constraints in the pursuit, of your goals; whereas the view whose objective is to minimize the violation of these rights allow you to violate the rights (the constraints) in order to lessen their total violation in the society (1974-29).

He takes the example of the right to live to illustrate his point.

> A mob rampaging through a part of town killing and burning will violate the rights of those living there. Therefore, someone might try to justify his punishing another *he* knows to be innocent of a crime that enraged the mob, on the grounds that punishing this innocent person would help to avoid even greater violations of rights by others, and so would lead to a minimum weighted score for rights violations in the society (1974, 28-29).

And, of course, on the side-constraint view (probably, even the contemplation of) punishing the innocent will be forbidden, since it will violate his right to life.

The right to life is an example of a right whose non-violation can be incorporated in the end to be achieved or accepted as a side-constraint on

actions. But are all rights of this sort? Can every right be placed as a side-constraint? Think of the right to a 'minimum standard of life'. Can this be placed as a side-constraint? Is it not a right whose fulfilment must be pursued as a goal? Probably, Nozick is correct to the extent that a right that can operate as a side-constraint must be incorporated as a side-constraint. But this should not obscure from us the fact that there may be rights which cannot operate as a side-constraints; that there may be rights whose fulfilment must be pursued as a goal. Take, for example, Locke's right to charity mentioned in his *First Treatise* as the right of the needy to the surplusage of the wealthy (sec. 42).

In the above argument, we are, of course, taking rights to be independently identified, and then asking whether its non-violation be put as a side-constraint or whether its fulfilment be pursued as a goal. But, Nozick is probably using the side-constraint view not as a theory regarding what to do with independently identified rights but as a part-filter to select what a right is. Nothing will qualify as a right unless its non-violation can be put as a side-constraint. But this will go against many ordinary rights. For example, your right to payment from me since I had borrowed from you. Is this right of yours a right whose non-violation is a side-constraint on me? Or is it a right whose fulfilment is a goal to be pursued by me? I think the answer is, obviously, the latter.

The view that rights can only be put as a side-constraint is based on the view that a right of mine always puts others under a duty not to perform certain actions or prohibits others from doing certain actions. But it fails to take into account the view that the fulfilment of certain rights may require that certain actions be performed and not merely that certain actions be not performed. The former view will be correct, if the only rights we have are rights to liberties or the right to liberty. But, unfortunately for Nozick, we have rights to many things other than the liberty or liberties.

According to Nozick:

> The moral side-constraints upon what we may do...reflect the fact of our separate existences. They reflect the fact that no moral balancing act can take place among us, there is no moral outweighing of one of our lives by others, so as to lead to a greater overall good. (1974, 33).

Fact of separate existence of humans may be a good instrument to beat utilitarians with. But it hardly justifies the side-constraint view as against Rawls' maximum principle or the principle that a minimum standard of life be secured for all or the very fact that the needy or the worst off has his own separate life to lead, that his suffering cannot be balanced by others' good fortune, and that he requires the assistance of others. In fact, it is quite unclear why mere non-interference be taken as expressive of the fact of separate existence and the requirement of positive assistance to the needy or the worst

off be not taken as a mark of the fact of separate existence. The latter view is not the same as utilitarian maximization of happiness, which fails to take the fact of separate existence.

Another argument, not unrelated to the argument given above, runs as follows. 'Side-constraints upon action reflect the underlying Kantian principle that individuals are ends and not merely means, they may not be sacrificed or used for the achieving of others ends without their consent. Individuals are inviolable.' (1974, p. 30-31). If people are allowed to retain the minimum portion of their income for which they will be *willing* to work and the surplus be taken to assist the worst off or the needy, there is no violation of the Kantian precept (Agarwala, 1988, 510).

In Nozick's view, the requirement of moral side-constraints is related to the idea of meaning of life. 'A person's shaping his life in accordance with some overall plan is his way of giving meaning to his life, only a being with the capacity to so shape his life can have or strive for meaningful life' (1974, 50). To give shape to one's own life one will probably need freedom to do so, and hence side-constraint must be put on what others may do to him. But is not this inadequate? Apart from freedom, will not persons need other grounds to pursue any coherent conception of life? So, to give scope to everyone to lead his life meaningfully, is it wrong to require that society come to the assistance of the needy or the worst off?

In my view, the moral rights of a person are those interests of his which are accepted as good reasons for imposing disabilities or duties or obligations on others, and protection and promotion of which cannot be overridden by general interest calculated on the basis of other interests not so accepted. What are the interests so recognized? These interests are the interests in development and exercise of two moral powers identified by Rawls: the capacity for a sense of justice and the capacity to understand one's conception of the good; and all other interests that flow from these two highest-order interests. To put it in another way, the interests recognized are the interests in the capacity to understand and to act from moral reasons as some philosophers call it; and also the interest in the capacity to lead a meaningful life as Nozick calls it, and, of course, all the interests that flow from these two highest-order interests. One can see that these interests for protection and promotion require not only rights to certain liberties but also rights to opportunities and other welfare rights too.

II

According to Nozick, individuals have certain rights independently of the form of social organization under which they live, and these rights put constraints on the institutional arrangements that can be made for individuals. These are the natural rights of men. Natural rights of men which they have independently of the society may be understood in two senses. In one sense, the sense in which Rawls uses the term natural rights may signify claims:

> [which] depend solely on certain natural attributes the presence of which can be ascertained by natural reason pursuing common sense methods of inquiry. The existence of these attributes and the claims based upon them is established independently from social conventions and legal norms. (Rawls, 1971, 505n).

Nozick does not use the term natural right in this sense. According to him, the natural rights are the rights which the persons have in the state of nature, a non-state situation, i.e., a situation where there is no state.

The natural rights that Nozick accepts are given in the following passage in the *Anarchy, State, and Utopia*:

> Individuals in Locke's state of nature are in 'a state of perfect freedom to order their actions and dispose of their possessions and persons as they think fit, within the bounds of the law of nature, without asking leave or dependency upon the will of any other man'. The bounds of the law of nature require that 'no one ought to harm another in his life, health, liberty, or possessions'. Some persons transgress these bounds, 'invading others' rights and...doing hurt to one another', and in response people may defend themselves or others against such invaders of rights. The injured party, and his agents may recover from the offender 'so much as may make satisfaction for the harm he suffered', 'every one has a right to punish the transgressors of that law to such a degree as may hinder its violation', each person may, and may only 'retribute to (a criminal) so far as calm reason and conscience dictate, what is proportionate to his transgression, which is so much as may serve for reparation and restraint (1974, 10).

Now we can see why Nozick cannot take natural rights in the first sense. If natural rights are taken in this sense, then right to education, right to minimum standard of life and other recipient rights are admissible, which are conspicuous by their absence in Nozick's list of natural rights. Not only that the rights in the first sense are rights which one can enjoy in any organized society. But Nozick's right of each to punish the offender of natural law cannot be enjoyed in any organized society. Hence Nozick's rights are rights which can be enjoyed in a non-state situation.

But, unfortunately, the status of the state of nature in Nozick's theory is quite unclear. It is neither a historical state of affair as accepted by Locke, nor a hypothetical situation that would arise if we were to imagine the absence of state as accepted by Hobbes. The latter is discounted by Nozick, because it involves 'the gratuitous assumption that everyone everywhere would be in the same non-state boat' and because of 'the enormous unmanageability of pursuing that contrafactual to arrive at a particular situation', and, finally 'that situation would lack fundamental theoretical interest'

(1974, 4). According to Nozick, it is a 'non-state situation in which people generally act as they ought'. Does Nozick's state of nature describe the moral point of view that anyone can adopt to 'decide what one should try to achieve'? The answer is 'no', for he immediately says: 'Yet this state-of-nature situation is the best anarchic situation one reasonably could hope for' (1974, 5).

Let us assume, as Nozick claims, that it is a kind of moral situation. Then, why should it consist merely in prohibitions and permissions? Is not the morality of the state of nature too frail? Why should the morality not consist in positive duties and ideals? Even Locke, from whom Nozick derives so much inspiration, admits in his *First Treatise* that a proprietor who has more than enough to sustain himself is under a positive duty to sustain those who do not. According to Locke, if a case of need arises, then, *ipso facto*, one man's individual right is overridden by another's claim, and the goods become his property (sec., 42). By failing to hand over the goods, the proprietor invades the share now belonging to the needy, and (by virtue of what Locke accepts in his *Second Treatise*), he is liable to punishment (sec., 37).

Another question that must be answered is: how extensive is the freedom in Nozick's state of nature? Does this freedom imply freedom to become slave of another? After all one can dispose of one's person as one thinks fit. If not, why? No law of nature prohibits it. Can we dig out any limitation from the condition 'without asking leave or dependency upon the will of any other man'? If the answer is in affirmative, then does it not prohibit even selling one's labour for wages? After all, by selling labour one has to work according to the others' command, and has to take leave of another to do as one thinks fit. So, how can slavery be prohibited without prohibiting selling one's labour in Nozick's non-state situation? After all the distinction is merely that of duration.

In a socialist democratic society, this problem does not arise, even though the person sells labour to the society, since he participates in the decision-making to direct the labour through his representatives in democratic voting.

The problems for Nozick emerge from his failure to give a basis for the natural rights. He is aware of this lacuna, for he writes: 'This book does not present a precise theory of the moral basis of individual rights? (1974, xiv). Had he developed a moral basis for rights, he would , probably, have seen that the rights to liberty that we have are not so extensive as to leave no room for welfare rights; that we have rights to some basic liberties only which are consistent with welfare rights. And then, probably, he would have seen that from the moral basis of rights themselves follow welfare rights as it has been realized by Rawls, Dworkin, Gewirth and others.

III

If the list of rights admitted by Nozick is the charter by which the state and society is to be assessed, then there is a problem. Apparently, no social or

political arrangement, short of the state of nature, can satisfy them. If there is to be a state, then, at least, it will violate the right of each to punish the offender of the law of nature. So, how to justify the state? The traditional solution based on explicit or tacit or hypothetical consent has been rejected by Nozick. He advances what he calls the invisible hand explanation of the existence of the state. According to him, it will arise automatically from the state of nature through steps which violate no one's rights, steps which persons take without any intention to set up a state.

According to Nozick, the state emerges from the state of nature by many steps which persons take to avoid for the following difficulties. Firstly, 'private and personal enforcement of one's rights...leads to feuds, to an endless series of acts of retaliation and exactions of compensation. And there is no firm way to *settle* such a dispute, to *end* it and to have both parties know it is ended' (1974, 11). Secondly, 'in a state of nature a person may lack the power to enforce his rights; he may be unable to punish or exact compensation from a stronger adversary who has violated them.' (1974, 12). To avoid these inconveniences, persons may make 'mutual protection associations' joining with their families and friends. Such an association, requiring everyone to fight and at the mercy of the chronic complainant, will be in great difficulty when their own members fight. Hence protection agencies will arise, each one of which would arbitrate, for a fee, all complaints made by its members, and, where necessary, act against the offenders both within and outside its fold.

One of such agencies or a federation of agencies will become dominant in each territory by winning in fight with other agencies or by making compromise with them respectively. According to Nozick, this dominant protection agency looks very much like a minimal state.

> Out of anarchy, pressed by spontaneous groupings, mutual protection associations, division of labour, market pressures, economics of scale, and rational self-interest there arises something very much resembling a minimal state or a group of geographically distinct minimal states (1974, 16-17).

But these protection agencies, even though they function as 'the night-watchman state of classical liberal theory, limited to the functions of protecting all its citizens against violence, theft, and fraud, and to the enforcement of contracts and so on' (1974, 26), lack monopoly of force and do not have jurisdiction over persons unwilling to accept its services.

But, according to Nozick, since each person has a right to protect himself or to get his agency to protect him against the risk of independents enforcing their rights unfairly and unreliably, the agency, without violating any one's rights, may start providing services to protect against this risk, thereby claiming in effect the monopoly of force.

In the last step, the protection agency must compensate independents for the disadvantage at which they are put due to the agency not allowing them to enforce their rights against its members by extending its protection to them (1974, 10-11). And hence the protection agency will have jurisdiction over all non-members too.

Has Nozick really succeeded in showing that the state will emerge from the state of nature? Security against external agression, i.e., aggression from members from other agencies will be available to all residing within the territory of the agency. This will give rise to free riders problem, and it will be difficult to provide this security through the market unless some mechanism is devised whereby only the clients are protected and not the non-members.

The security against aggression from internal members will also give rise to the problem of free riders in Nozick's scheme of things. The free riders, in the case of Nozick, are the protected non-memebers who do not pay for protection. So, will not others leave the agency and like to be protected as non-members? Nozick's answer is very brief.

> Not to any great extent, since compensation is paid only to those who would be disadvantaged by purchasing protection for themselves and only in the amount that will equal the cost of an unfancy policy when added to the sum of the monetary costs of self-help protection plus whatever amount the person comfortably could pay. Furthermore, the agency protects these independents it compensates only against its own paying clients on whom the independents are forbidden to use self-help enforcement. The more free riders there are, the more desirable it is to be a client always protected by the agency. This factor, along with the others, acts to reduce the number of free riders and to move the equilibrium towards almost universal participation (1974, 113).

The last point undercuts itself because of the very reason that each will like to be a free rider in turn. As far as the first point is concerned, Nozick explains nowhere whether the cost of providing the protection of a fixed amount or the cost of assessing the amount of protection to be given to the non-members is greater. In my opinion, the cost of the later is likely to be greater in real life situation. So, this will undercut Nozick's argument.

Even if Nozick is right and a minimal state will arise from Nozick's state of nature by legitimate steps, what does it show?

According to Nozick:

> If one could show that the state would be superior even to this most favoured situation of anarchy, the best that realistically can be hoped for, or would arise by a process involving no morally impermissible steps or would be an improvement if it arose, this would provide a rationale for the state's existence, it would justify the state (1974, 5).

Would it really justify the state? Simply because a particular distribution of money could have come about by a series of bets none of which is morally impermissible, would it justify enforcement of that distribution? To be enforceable the distribution must have come about by actually following the fair bets. Similarly, to be justified it would be necessary for the state to have actually come about by those morally not impermissible steps or decisions. To back up his contention, Nozick claims:

> A Theory of a state of nature that begins with fundamental general descriptions of morally permissible and impermissible actions, and of deeply based reasons why some persons in any society would violate these moral constraints, and goes on to describe how a state would arise from that state of nature, will serve our explanatory purposes, *even if no actual state ever arose that way* (1974, 7).

The use of terms like 'fundamental general description' and 'deeply based reasons' hardly helps answering the questions: why should we take interest in such false explanations? Why should it be justifiable for us to accept a state on the ground that state will emerge in the state of nature? He writes:

> A fundamental potential explanation (an explanation that would explain the whole realm under consideration were it the actual explanation) carries important explanatory illumination even if it is *not* the correct explanation. To see how, in principle, a *whole* realm could fundamentally be explained greatly increases our understanding of the realm (1974, 8).

The contention is hardly self-evident. It is even more controversial than the justification of the state which it is supposed to back up.

Even at the cost of being charged with the fallacy of *ad hominem*, it must be mentioned that Nozick has been bewitched by his own profound looking and sounding jargons of 'fundamental potential explanation', 'fundamental general description', 'deeply based reasons', etc. into believing that his explanation has justificatory force, which, in fact, it lacks. Even, on his own admission, he started with taking 'libertarian views seriously enough to want to refute them' (1974, xvi), but half-way through, it appears, he was bewitched by his own jargons and became a convert.

Nozick will probably, reply that in my argument I am substituting 'could' in place of 'would'. He will concede that it is no argument to enforce even the minimal state, simply because it 'could' have come about automatically from the state of nature, since 'from a just situation a situation *could* have arisen via justice-preserving means does *not* suffice to show its justice' (1974, 1951). And he will claim that he has shown that the minimal state *would* (necessarily) arise from the state of nature and that hence it can be enforced. This is confirmed by Nozick's view on rectification of injustice in holdings,

where he claims a person may be compensated on the basis of 'information about what *would* have occurred...if the injustice had not taken place' (1974, 153, emphasis added). Let us see whether this reply will help Nozick. Suppose, the present national states were to dismantle their coercive apparatus down to size of the Nozick's minimal state. Would they be justified? Would they become legitimate? The answer is in the negative. Nozick cannot show that the minimal state with the national boundaries that actually obtain *would* emerge from the state of nature. At the most it could be claimed that they *could* have emerged. Had we actually started from the state of nature, we *might* have, for all we know, landed up with different boundaries for the states or with no boundaries but only one state with nations as federal constituents. Nozick's argument will justify only the minimal state or states that would arise, had we actually started from Nozick's state of nature. It cannot, by any stretch of imagination, justify the enforcement of the minimal state within national boundaries or any actual boundaries, unless he shows what boundaries will emerge from justice preserving steps from the state of nature.

Another problem Nozick will face is how to justify the democratic aspirations. According to his view, any state, be it democratic or otherwise, will be just, provided it performs the night watchman functions well. Nozick also will be open to the objection that the agency may give different kinds of protection on different payments to its clients, but this is not how citizens relate themselves to a state. The very idea of state and citizen relation cannot be analysed as a relation between a client and a business corporation or organization as claimed by Nozick.

IV

Is Nozick justified in thinking that from the state of nature only a state with night watchman duties will emerge by morally permissible steps? I think it is very one sided to claim that in the state of nature the only problem will be that of security. There will be other difficulties too. Think of flood, famine, epidemic, and a host of other natural and unnatural calamities that people will suffer in the state of nature. Will market be able to provide protection services against these? Think of various social and public goods, say, light house for nevigation, etc. Will market be able to supply these goods? What about unemployment? What will happen when inflation takes place? Will not the state be entrusted with the duties to supply the public goods, to stabilize the prices, to raise employment? Will this violate the rights of others?

Nozick's answer to these questions will be an emphatic 'yes': These duties of the state cannot be derived without the right of fairness, backed by the principle of fairness which says:

> When a number of persons engage in a just, mutually advantageous, co-operative venture according to rules and thus restrain their liberty in ways necessary to yield advantages for all, those who have submitted to

> these restrictions have a right to similar acquiescence on the part of those who have benefitted from their submission (1974, 90).

Why will this right not be acceptable in the state of nature? Nozick finds the principle of fairness objectionable and unacceptable. He gives the following counter-example to this principle.

> Suppose some of the people in your neighbourhood...have found a public address system and decide to institute a system of public entertainment. They post a list of names, one for each day, yours among them. On his assigned day...a person is to run the public address system, play records over it, give news bulletins, tell amusing stories he has heard, and so on. After 138 days on which each person has done his part, your day arrives. Are you obligated to take your turn? You *have* benefitted from it, occassionally opening your window to listen, enjoying some music or chuckling at someone's funny story. The other people *have* put themselves out. But must you answer the call when it is your turn to do so? As it stands surely not (1974, 93).

The reason Nozick gives is this:

> Though you benefit from the arrangement, you may know all along that 364 days of entertainment supplied by other will not be worth your giving up *one* day. You would rather not have any of it and not give up a day than have it all and spend one of your days at it. Given these preferences how can it be that you are required to participate when your schedule time comes? (1974, 93).

So he argues: 'At the very least one wants to build into the principle of fairness the condition that the benefits to a person from the actions of the others are greater than the costs to him of doing his share' (1974, 94).
But this also will not satisfy Nozick.

> ...it still would be objectionable. The benefits might only barely be worth the costs to you of doing your share, yet others might benefit from *this* institution much more than you do... or perhaps you would prefer that all co-operated in *another* venture, limiting their conduct and making sacrifices for it (1974, 94).

Not only this. In Nozick's view:

> ...enforcing the principle of fairness is objectionable. You may not decide to give me something, for example a book, and then grab money from me to pay for it, even if I have nothing better to spend the money on...

> you have, if anything, even less reason to demand payment if your activity that gives me the book also benefits you, suppose that your best way of getting exercise is by throwing books into people's houses, or that some other activity of yours' thrusts books into people's houses as an unavoidable side effect. Nor are things changed if your inability to collect money or payments for the books which unavoidably spill over into others' houses makes it inadvisable or too expensive for you to carry on the activity with this side effect. One cannot, whatever one's purpose, just act so as to give people benefits and then demand (or seize) payment. Nor can a group of persons do this. If you may not charge and collect for benefits you bestow without prior agreement, you certainly may not do so for benefits whose bestowal costs you nothing and most certainly people need not repay you for costless-to-provide benefits which yet *others* provide them (1974, 95).

What does this lengthy argument of Nozick amount to? It amounts to laying down conditions for acceptability and enforceability of rights, and then showing that the right of fairness violates this. Hence, in this argument, Nozick is developing implicitly a theory of rights, which, in the very beginning, he had denied having developed. Firstly, the right of fairness and its corresponding duty will be accepted, only if the action required to be performed to discharge the duty has costs less than the benefits which give rise to this duty. Secondly, the benefits which give rise to duty may not be slightly more than the cost, but must be considerably more than the cost, etc. For enforcement of duty one of the conditions is that one must have agreed to it first. If these tests are applied, then Nozick's own rights like the right to punish the violation of the law of nature will not survive. So, these are not good tests for acceptability of a right and correlative duties. Rather, something like Rawl's original position is the proper perspective to decide the adequacy of a right, and there the right of fairness is unanimously accepted.

Nozick, will, of course, reply that he is not developing an implicit test of rights but only discussing the conditions to be built into the right of fairness and that he is appealing to our intuitions. But, unfortunately, intuitions will not help Nozick on the face of the global acceptability of the right of fairness as testified through the acceptability as well as demand of enforced provision of public and social goods throughout the world including America.

Coming to the specific examples, we can say that the public broadcasting with enforced tax for the services provided does not go against moral intuitions. Yet, the example of public broadcasting given by Nozick appears so counter-intuitive. Is it because the principle of fairness is counter-intuitive? The answer is in the negative. Nozick's broadcasting example does not satisfy the principle of fairness at all. In his zeal to give a counter-example, he notices only the mutual advantage condition but fails to notice the justice requirement of principle of fairness. It must be remembered that principle of fairness

holds that a person is required to do his part as defined by the rules of arrangement when two conditions are met: first, the arrangement is just; and, second, one has voluntarily accepted the benefits of the arrangement. The broadcasting example given by Nozick does not satisfy the requirement of justice that the public decision be arrived at democratically by participation of all the members of the society. It is a requirement of justice that it must respect the right of each to participate in the decision-making. So, Nozick's example is irrelevant and not a counter-example to the principle of fairness.

Similarly, the book throwing example is also irrelevant, for it violates not only the democratic requirement of justice but also another condition that private goods be not forced on others against their wishes. Justice requires the individual's sovereignty over his private goods consumption decision. Counter-intuitiveness of the example of book throwing is because of its failure to satisfy the fairness principle, and hence it is not a counter-example but irrelevant.

Unfortunately, Nozick, in his zeal to justify only the night watchman state, forgets to ensure that it be democratic. Had he made his state democratic, then the scruples he has regarding the acceptability of the co-operative venture for provision of public goods would have vanished, provided the decision is based on majority opinion of the state.

So, Nozick's claim that the right of fairness is not acceptable in the state of nature is not correct. If this right is accepted, then the road is open for the emergence of a state which has duties and powers beyond the minimal state without violating anyone's rights.

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Śaṅkara and Derrida on philosophy of language

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The thought of Jacques Derrida is increasingly being used by philosophers, literary critics and scripture scholars as offering important theoretical insights for the interpretation of language.[1] Śaṅkara's philosophy, and Vedānta in particular, is first and foremost a kind of Mīmāṁsā or exegesis for the purpose of interpreting the true meaning of Vedic scriptures, especially the role scripture plays in realizing liberation.[2] Thus, for both Śaṅkara and Derrida philosophy is mainly to be understood as philosophy of language. And the focus of philosophy for both is on the way in which the interpretative function of language is to be understood in relation to the real. This paper will proceed by comparing Śaṅkara and Derrida on three points: (i) the relation of language to the real; (ii) Śaṅkara versus Derrida on the nature of the real; and (iii) the end goal: language as a call for action versus a revelation of intuitive knowledge.

The Relation of Language to the Real

Derrida has attracted wide attention with his oft-quoted phrase 'Il n'y a pas de hors-text' ('There is nothing outside of the text').[3] Philosophers who see language as functioning by symbolizing an external referent (e.g. the view that the word 'God' has for its referent a real divinity which exists over and above the word) find Derrida's statement to be both outrageous and wrong. Derrida's denial of 'a real' existing outside of the text is seen to be a denial of reality, a denial of God and, at best, some new form of nihilism.

From the perspective of Indian philosophy, Derrida would, at first glance, seem to be taking an approach similar to the Buddhist view of language, namely, that it has no grip on the real; it is merely *vikalpa* or imaginary constructions which play over the surface of the real without giving us access to it.[4] Indeed, one Western scholar, Robert Magliola, has argued that Derrida is Nāgārjuna in a modern Western garb.[5] But this is to misunderstand Derrida's analysis of language and its relation to the real. In fact, Derrida seems very close to the grammarian perspective of Bhartṛhari in his view that language and consciousness are beginninglessly identified with each other. Language, for Derrida, is the active force for differentiation present in trace form in all consciousness.[6] Indeed, Derrida even goes so far as to suggest that the seed or trace of language is present in all substances—a kind of linguistic DNA. Derrida's notion of language with its originary linguistic trace seems very close to Bhartṛhari's description of language as beginninglessly intertwined with all consciousness[7] and identified with the real in the form of the

śabdatattva.[8] For Derrida the real is nothing but consciousness composed of its inherent linguistic trace which is dynamically expressed in manifested language.

We shall deal with Derrida's understanding of the mechanics of language below. For now the important thing to establish is that, rather than holding a scepticism of language, namely, that it is devoid of the real (the conclusion of the Mādhyamika Buddhists and many modern skeptical critics of language), the real for Derrida is seen to be present in the very dynamics of language itself. It is in this sense that Derrida states that there is nothing outside of the text.

Let us now relate all of this to Śaṅkara's view of language and its relation to the real. Just as Śaṅkara disagrees with the grammarian identification of language with Brahman, so he would reject Derrida's 'there is nothing outside of the text', but not for the same reason as the Buddhists. For Śaṅkara Brahman, the real, exists separate from language in that when language is cancelled out (as in the final direct perception prompted by *tat tvam asi*) Brahman alone remains.[9] Language as part of *māyā* is ultimately unreal. But it is not as unreal as the Buddhists would have it. Indeed, for Śaṅkara, language as Veda is the only means by which Brahman, the real, can be realized. But even the best language, the *mahāvākyas* of the Upaniṣads, must be left behind for the *anubhava* or direct experience of Brahman to occur. This is clearly evidenced by Śaṅkara's theory of error in which the realization of Brahman is simultaneous with the cancellation of the *mahāvākya*—the snake disappears completely when the rope is seen. Ultimately, then, for Śaṅkara, it is the Upaniṣadic *neti neti*, speech as a *via negativa* to the real, which characterizes Śaṅkara's theory of language.

Śaṅkara versus Derrida on the Nature of the Real

As we have seen, for Śaṅkara language, even the language of Sruti, has to be cancelled out or transcended for the real to be experienced. This is because the essential characteristic of language is difference, and difference is antithetical to identity which characterizes the monism of Śaṅkara's Advaita theory.[10] As an Advaitin, Śaṅkara maintains, from various identity statements in the Upaniṣads, that all difference is negated and transcended in the direct experience of the real. Śaṅkara emphasizes the impossibility of using the diversity of language, even the higher language of the *jñāna-kāṇḍa*, directly to designate reality.[11] For Śaṅkara, the recognition of distinctions between things is of the nature of *avidyā* and is that which obstructs the recognition of the real. Language, due to its necessary conceptualization of reality into words and sentences, becomes a part of that difference which obscures the real. The difference of all language is part of the *māyā* which hides Brahman from our view.

Whereas difference is the *avidyā* to be overcome for Śaṅkara, it is difference

as manifested in the dynamic tension of language that is the real for Derrida. All language, says Derrida, finds its source in 'difference' (as the linguist Saussure had claimed).[12] In Derrida's view, it is precisely this general movement of difference that is the arche-trace which contains within it the possibility for all speech and writing. The real is nothing but the dynamic expressive difference of language. It is this moment of difference which permits all thought, speech and writing, and makes possible the opposition between signifier and signified.[13] The functional parallel for *avidyā* (Śaṅkara's notion of the obstruction of the real) is for Derrida the privileging of one of the opposites of language over the other, and thereby destroying the dynamic tension between the opposites. It is the tension between the opposites which is for Derrida the hallmark of the real. This is the hidden intent behind the term 'deconstruction' when used in connection with Derrida's thought. What is being deconstructed by Derrida in his analysis of language use is the human privileging of one of the pairs of opposites over the other. Western thought, he observes, has been developed in terms of opposites: good versus evil, being versus nothingness, truth versus error, identity versus difference, mind versus matter, man versus woman, etc. But these opposites have not been viewed as equals, for the second term is always seen as a corrupted version of the first. Evil is seen as the lack of good and difference as an obstruction of identity.[14] The opposites are not maintained in dynamic tension, but are placed in a hierarchical order which gives the first priority. As a result, much philosophy has engaged in a privileging of identity over difference.

At this point, Derrida would apparently be offering a critique of Śaṅkara's emphasis upon identity. However, on closer analysis, the two are seen to be engaged in a similar philosophical tactic. Just as Śaṅkara would use the conceptual term 'identity' as simply a hint or pointer as to the nature of the real, so also Derrida admits that his use of 'difference' to indicate the nature of the real must be constantly deconstructed. Both Śaṅkara and Derrida agree that the conceptual oppositions that make up language are the obstacles that get in our way of the experience of the real. Identifying oneself with either of the terms that make up these oppositions (e.g. 'identity' for Śaṅkara; 'difference' for Derrida) is the trap of language that must be overcome. For Śaṅkara the only way out is to transcend language altogether, so that all of the opposites and, indeed, all conceptualizing is cancelled by the direct intuition (*anubhava*) of the real. By contrast, Derrida thinks this trap may be escaped by staying within language but on the middle path between the pairs of opposites. It is when the opposites of language are maintained in dynamic tension through a continual deconstruction of first one opposite and then the other that the real is experienced. For the moment the real is spoken it is tending to swing the pendulum of language toward either one or the other of the opposites. It is only by a continual deconstructing and reversing of each pendulum swing that we may experience the real as the middle point where the tension between the pairs is momentarily in

balance. For Derrida the constant change and challenge that this deconstruction requires is not a cause for lament; it is rather the recognition that such a process with its ongoing need for deconstruction is itself the real. Again we are reminded of Mādhyamika and the relentless critique of the *catuskoṭi* as the basic task of philosophy. Derrida would agree, but would deny the Buddhist and Advaita contention that there is another option open, namely, the transcending of the trap of language altogether. For Derrida there is no *anubhava* or *śūnya* experience of the real outside of language. At this point Derrida is a typical Westerner in his view that it is in the midst of the existential struggle, not beyond it, that the real is most fully realized.

The End Goal: Language as a Revelation of Knowledge (Śaṅkara) vs. Language as a Call for Action (Derrida)

Both Śaṅkara and Derrida have a practical goal in mind in their philosophy of language. For them the philosophy of language is not just abstract theorizing; it has the practical goal of spiritual self-realization. Between them, however, the nature of this self-realization is quite different: for Śaṅkara it requires the total transcending of language, while for Derrida it is found in the prophetic call for action that comes to us from the very midst of language itself.

Before proceeding we must sound a note of caution. The interpretation of Derrida which we shall offer—an interpretation which places his philosophy within the prophetic line and gives it an explicitly spiritual goal—is something new. I have not found it in any other writing on Derrida. Derrida keeps his spiritual self well hidden. However, I have found some clues in a recent but little-known paper entitled 'Of an Apocalyptic Tone Recently Adopted in Philosophy', a paper in which Derrida offers a close reading of the book of 'Revelation', the last book of the Christian *New Testament*.[15] In this paper Derrida thinks of deconstruction as a kind of prophetic critique of all absolutes, all opposites, which ends not only in a balancing of the opposites but also in a call to moral action.

But let us begin with Śaṅkara.

As noted at the outset, Śaṅkara's Advaita is essentially a philosophy of exegesis, a way of coming to the true meaning of scripture. Śaṅkara's approach is to divide the Vedic corpus which includes the Saṁhita (poetic hymns), Brāhmaṇa (directions for sacrifice) and Upaniṣads into two categories: a lower one dealing with actions (*karma-kāṇḍa*), a higher one dealing with knowledge (*jñāna-kāṇḍa*).[16] The Pūrva-Mīmāṃsa philosophy of language, with its emphasis upon the verb as conveying the meaning of the sentence (i.e. an injunction to action), is taken by Śaṅkara as an appropriate form of exegesis for the *karma-kāṇḍa* texts. But this Pūrva-Mīmāṁsā approach is not applicable to the *jñāna-kāṇḍa* texts of the Upaniṣads that tell us of the identity of the self with Brahman. Statements such as *Tat tvam asi* are not injunctions but declarations of fact, 'statements whose subject-matter exists already that is Brahman, or the Self'.[17] Whereas in the first approach people see themselves as agents following scriptural injunctions and engaging in religious rituals to achieve results (e.g. rebirth in *svarga*), the *jñāna-kāṇḍa*, by contrast, is seen by Śaṅkara as addressing a separate group of people—those who have become eligible to hear the statements about Brahman by virtue of their moral purity, intelligence, and intense spiritual desire for release. Since the whole point of statements like the *mahāvākyas* or the *neti, neti* sentences is to imply that there are no differences in the real, they can only be comprehended by someone who is just on the verge of the *anubhava* experience—the direct realization that the real, Brahman, the self, is without distinctions.[18] We will have to come back to the question of just how Śaṅkara understands the sentences of the *jñāna-kāṇḍa* are able to produce this result, but first let us look at Derrida's approach to self-realization.

Although Derrida deconstructs the metaphysics of *logos*, presence or any suggestion of theistic religion, there is a teleology that may be found in his philosophy of language. In *Of Grammatology*, Derrida discusses the nature of the arche-trace. This trace, like the *śabdatattva* of Bhartṛhari, contains within itself all the possibilities for manifestation as the primordial 'difference'. This 'difference' is the inherent theological force within us that leads to self-manifestation.[19] And this self-manifestation is structured according to the diverse possibilities of the trace. The general characteristic of the manifested trace is that of temporal becoming. Within this becoming, the theological is but one moment in the total movement of the trace.[20] The trace with its seed of difference is not more biological than spiritual, but in its manifestation is found the possibility for all the pairs of opposites. While not a systematic thinker, Derrida does give a hint as to how he sees this process:

> Representation mingles with what it represents, to the point where one speaks as one writes, one thinks as if the represented were nothing more than the shadow or reflection of the representer.... In this play of representation, the point of origin becomes ungraspable.... There is no longer simple origin. For what is reflected is split *in itself* and not only as an addition to itself as its image. The reflection, the image, the double, splits what it doubles. The origin of the speculation becomes a difference.[21]

It is the direct experience of this dynamic process of becoming, not as a process of static reflection or metaphysical opposition, that would be for Derrida the realization of the spiritual whole. The sensitive deconstruction of the illusions of permanence, of stasis, or presence (which ordinary experience and many philosophies superimpose on the becoming of language) is Derrida's prescription as the means for the realization of the whole. We cannot name this whole 'spiritual', for that is already to engage the vocabulary of metaphysical opposition. But to understand the whole as manifestation of the

inherent difference of trace is for Derrida the goal. To go from the outer manifested forms of speech and thought to the arche-trace, which prefigures and predisposes such manifestations, only to be thrown back again in a continual deconstructive reverse, would seem to be Derrida's use of language as a spiritual discipline. Although this may look like a Mādhyamikan answer, it is not. The deconstructive reverse does not result in the silence (*śūnya*) of language but rather in the realization that the dynamic tension in the becoming of language is itself the whole. For Derrida all of this cannot be understood as abstract theorizing. The language we are deconstructing is our own thinking and speaking, our own consciousness. We ourselves are the text we are deconstructing. That is why, there is nothing outside of texts for Derrida. Deconstruction is the process of becoming self-aware, of self-realization. Thus for Derrida the science of grammatology or deconstruction enables one to experience language as ontological rather than as purely epistemological in function. As we think, speak and write, language speaks and writes us, impelling us into action.

In many ways this approach of Derrida's is just the opposite of that of Śaṅkara. For Śaṅkara language is epistemological rather than ontological in function. For him self-realization is not the realization that we ourselves are the text (Derrida's position), but rather the realization that language is the *māyā*, which is totally transcended when the ontological real, Brahman, is seen. For Śaṅkara the goal is not to be impelled into action by language (Derrida's view) but to transcend language and action and realize the direct knowledge of Brahman.

In a very real sense Śaṅkara's view of language is ambivalent. Because language is the instrument of *avidyā* breeding mental constructions that distort reality by hiding our true self from us, Śaṅkara is suspicious of language. On the other hand, he recognizes that *mokṣa* cannot be realized without language, especially the speech of the *jñāna-kāṇḍa*. Although the great sentences of the Upaniṣads are ultimately fake (because they are language and as such the products of *avidyā*), still, says Śaṅkara, one can be liberated by hearing a falsehood, just as one can be killed by being frightened by an illusory snake. Śaṅkara's theory of language, like his theory of error, is that the erroneous sentence, in this case the scriptural sentence, must be completely cancelled for the real to be known. The two are mutually exclusive. This is clearly very different from Derrida where the real is seen to be in the very midst of the tension between the pairs of opposites of language. To transcend this tension, to get out of language altogether is for Derrida an impossibility, whereas for Śaṅkara it is both possible and necessary.

But how does Śaṅkara suggest that one can get out of language? It requires that one learn another way of hearing the word, a way in which words no longer function as a direct designation of reality. The correct hearing of a *mahāvākya* gives no positive description of Brahman. For the properly prepared mind it is simply the occasion for the realization that knowledge of

Brahman is not conceptual at all but rather a direct intuition (*anubhava*), which is free from the taint of words or any of the other ordinary means of knowing.[22] Whereas Derrida's discriminative deconstruction constantly goes on as the very essence of reality, for Śaṅkara after the *anubhava* or direct intuition of Brahman no reflective consideration is possible, for there is no language or thought content left to reflect upon. While for Derrida there is nothing outside of language or the text, for Śaṅkara there is nothing of the text left in the *anubhava* experience. It is the text that is the subject which the Upaniṣadic *neti, neti* cancels out to enable the real to be known.

For both Śaṅkara and Derrida the goal of spiritual self-realization depends on the correct understanding of language and results in a transformation of our ordinary way of knowing. However, this common conclusion arises from remarkably different religious roots: Derrida from a critique of the Jewish and Christian understanding of God; Śaṅkara from an interpretation of the Veda. So far we have not said much that is explicit of Derrida's religious roots. In his relentless deconstruction of every logo-centric theology and even every negative theology, Derrida keeps his spiritual self well-hidden.[23] I want to suggest that Derrida's spiritual source is rooted in the Hebrew prophets. Just as Hebrew prophecy ruthlessly criticized every objectification of God, which packaged and separated God from the divine demand for ethical action in daily life,[24] so Derrida rigorously deconstructs all theology, philosophy and ordinary language which objectifies our experience into false Gods and unreal presences; and in so doing removes us from the imperative of God's call to moral action. That Derrida's deconstruction has a prophetic goal is suggested by his recent essay 'Of an Apocalyptic Tone Recently Adopted in Philosophy'.[25] In his close reading of the book of Revelation, Derrida identifies the theme of the text as an imperative 'come'—simultaneously a call to 'come' to the Lord and to 'come forth' into moral action (Revelation 22:17-20). The 'come' of the text evokes both the imminent coming of the Lord and the imperative that the hearer come quickly. This call, says Derrida, comes from beyond being or logos (conceptualized forms). It cannot come from a voice which is given any personification or theological description, for that would be to 'package' it in categories of presence. 'Come' is plural in itself, in oneself. Its only content, says Derrida, is its resounding imperative tone that calls us forth to action.[26]

The other characteristic of this book of Revelation, says Derrida, is its closing admonition: 'Do not seal [close] the words of the inspiration of this book....' To seal is to encapsulate or close off the inherent 'come' of language and/as religion. The 'come' from beyond being and the imperative 'come' within oneself never close. The action of coming to the call that never ceases is the end to be realized. All of this fits well with the prophetic impulse of the Hebrew Bible. Its relentless negation of any conceptualization of the divine (the sin of idolatry), its prophetic hearing of the call to obedience which must always translate into action, its open-ended future which calls

us to come to an end which is always simultaneously a new beginning—all of this seems to justify our rooting of Derrida in the spiritual critique of the Hebrew Prophets, a critique which Derrida has reformulated as a critique of all idolatrous use of language.

Conclusion

This initial comparative study of Derrida and Śaṅkara on language has proved stimulating and fruitful. It has identified points of formal and at times substantive contact between Derrida and traditional Indian philosophy.

While many Western philosophers find Derrida simply maddening or outrageous, approaching him from an Eastern perspective seems to make it much easier to see just what he is up to and to appreciate the contribution that he makes. For Indian philosophers, who want to relate the riches of the Indian views of language to the West, I would suggest that Derrida provides a ready-made bridge.

The results of this small comparative study calls into question the current suggestions of Robert Magliola that Derrida is a Mādhyamikan Buddhist in modern dress. We have shown that just the opposite seems to be the case, namely, that, while for Śaṅkara and Nāgārjuna language must be cancelled for the real to be experienced, for Derrida the real is most directly experienced in the very centre of language ('there is nothing outside of the text'). Derrida's beginningless and endless identification of language and consciousness would be rejected by Śaṅkara but welcomed by Bhartṛhari.

In terms of the nature of the real, Derrida and Śaṅkara clearly find themselves in opposite camps. Whereas difference is the *avidyā* to be overcome for Śaṅkara, it is difference manifested in the dynamic tension of language that is the real for Derrida. This distinction, as we saw, carries over into their contrasting perceptions of the end goal. For Derrida this difference manifests itself as a call for moral action. For Śaṅkara the action associated with difference is understood as the *saguṇa* Brahman which must be negated for the *nirguṇa* to be experienced.

It is at precisely this point that Derrida would surely challenge Śaṅkara's notion of *anubhava* as a pure perception free of the *avidyā* of language. Since Derrida does not believe that anything like 'pure perception', i.e., perception free of representation or interpretation exists,[27] his challenge to Śaṅkara is a significant one.

Notes and References

1. For a discussion of Derrida in the context of various theories of deconstruction in relation to interpretation, see Christopher Norris, *Deconstruction: Theory and Practice*, London, Methuen, 1982.
2. Karl H. Potter, *Advaita Vedānta up to Śaṃkara and His Pupils*, Princeton, Princeton University Press, 1981, p. 46.

3. Christopher Norris, *op. cit.*, p. 41.
4. Nāgārjuna, *Mūlamadhyamakakārikā*, Kenneth Inada (tr.), Tokyo, The Hokuseido Press, 1970. See also Gadjin M. Nagao, 'From Mādhyamika to Yogacāra: An Analysis of *MMK*, XXIV.18 and *MV* 1. 1-2' in *Journal of the International Association of Buddhist Studies*, Vol. 2, 1979, p. 32.
5. Robert Magliola, *Derrida on the Mend*, West Lafayette, Indiana, Purdue University Press, 1984.
6. Jacques Derrida, *Of Grammatology*, Gayatri Chakravorty (tr.), Baltimore, Johns Hopkins University Press, p. 51.
7. *Vakyapadiya*, I: 123 (*Vāk*).
8. *Ibid.*, I.1.
9. Śaṅkara, *Bṛhadāraṇyakabhāṣya* 1.4.7 as summarized by Potter, *op. cit.*, p. 186.
10. *Bṛhadāraṇyakabhāṣya*, *op. cit.*, II. 1.20, p. 191.
11. Karl Potter, *op. cit.*, p. 54.
12. Jacques Derrida, *Of Grammatology*, Gayatri Chakravorty (tr.), Baltimore, Johns Hopkins University Press, p. 52.
13. *Ibid.*, pp. 57-63.
14. Jacques Derrida, *Dissemination*, Barbara Johnston (tr.), Chicago, University of Chicago Press, 1981, p. x.
15. Jacques Derrida, *Semeia*, 23, 1982, pp. 63-97.
16. Karl Potter, *op. cit.*, p. 46.
17. *Ibid.*, p. 52.
18. Śaṅkara is careful to point out over against Maṇḍana that meditation from the passage in scripture that advises us to hear, think and reflect (*śravaṇa, manana, nididhyāsana*) cannot be construed as an action (as Maṇḍana Miśra does), for liberation is not a *result* and so cannot be reached by any activity, even meditation (see Potter, *op. cit.*, p. 52).
19. Jacques Derrida, *Of Grammatology*, Gayatri Chakravorty (tr.), Baltimore, Johns Hopkins University Press, pp. 46ff.
20. *Ibid.*, p. 47.
21. *Ibid.*, p. 36.
22. Karl Potter, *op. cit.*, p. 54.
23. See Jacques Derrida, 'Structure, Sign and Play' in *The Structuralist Controversy*, R. Macksey and E. Donato (eds), Baltimore, Johns Hopkins University Press, 1972, pp. 248-49, 264-65; *Dissemination*, pp. 293-94; *Of Grammatology*, pp. 71-73, etc.; *Writing and Difference*, pp. 64-78, 79-153.
24. See, for example, the book of Amos.
25. Jacques Derrida, *Semeia*, 23, 1982, pp. 63-97.
26. *Ibid.*, p. 94.
27. Jacques Derrida, *Of Grammatology*, Gayatri Chakravorty, (tr.), Baltimore, Johns Hopkins University Press, p. 54.

Philosophy and the sociology of knowledge: an investigation into the nature of orthodoxy (*āstikya*) in Hindu thought

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I

A standard presentation of orthodoxy in relation to the Hindu religious tradition would run as follows:

> The systems of Indian philosophy are classified into two groups, *āstika* (orthodox) and *nāstika* (heterodox). These two terms, however, are relative. One belonging to the so-called heterodox school may as well call those who are in the opposite camp heterodox. Various meanings are given to the word '*āstika*': (1) one who believes in the life after death, (2) one who believes in God, and (3) one who believes in the authority of the Veda. '*Nāstika*' means the opposite of these. As applied to the schools of Indian philosophy, '*āstika*' is to be understood in the third of the above senses. To the *āstika* group belong the six *darśanas* ... . They are Nyāya, Vaiśeṣika, Sāṅkhya, Yoga, Mīmāṁsā and Vedānta. The *nāstika* systems are Cārvāka, Bauddha and Jaina. These are called heterodox because they do not believe in the authority of the Veda.[1]

The concept of orthodoxy, however, has been much more dynamic in the history of Hinduism than such a statement allows for. The definition of orthodoxy provided above refers to a period when acceptance of Vedic authority became normative and pervasive. Before it became normative other interpretations of the word were in use, and after it became normative in the sense of Vedic authority other uses were suggested.

The earliest use of the word *āstika* in a philosophical sense is found in Pāṇini who cannot be placed later than fourth century B.C. At this stage the word is descriptive rather than normative, and this is further confirmed by the fact that Pāṇini speaks of three categories and not just two. 'Pāṇini classifies the views of various philosophical thinkers under three categories according to the basic points of view implied in their teachings. They were (1) Āstika, (2) Nāstika and (3) Daishṭika (asti nāsti dishṭam matiḥ IV. 4.60).'[2] The Daiṣṭika Mati is the school associated with the deterministic views of Makkali Gosāla.[3] The *āstika* view of this period is represented *not* by belief in Vedic authority but in theism. The upholders of *āstika* views here 'correspond to those whom the Buddhist books call the Īśvaravādins or the theists, who held that everything in the universe originated from the supreme Being. His

[Pāṇini's] *nāstika* philosophers correspond to those mentioned under Natthikadiṭṭhi.'[4] With the spread of Buddhism and its attacks on Hindu scriptures the Hindu tradition seems to have rallied round the Vedas, so that in the *Manu-Smṛti* the *nāstika* is lumped with the reviler of the Vedas. Some scholars assert[5] on the basis of this reference that, according to Manu (II.11), 'he who slanders the Veda is a *nāstika*'.[6] The use of the word slandering is significant; indifference to Vedic authority is deemed acceptable by implication. One must *reject* the Vedas to be a *nāstika*; the grey area between acceptance and rejection was the one in which those school of thought such as Sāṅkhya, etc. accommodated themselves which did not base themselves on the Vedas but also did not reject them. Hence the significance of Manu's statement.

Around the same time as that of Manu, that is, the second century A.D. one finds another trend, exemplified in the Jain and Buddhist approaches. *Āstika* meant belief in future life. 'According to this interpretation, the Buddhists and the Jains cannot be called *Nāstikas*. Nāgārjuna implies it when he says, "A *Nāstika* is doomed to hell". Manu, on the other hand, defines *Nāstika* as a person who challenges the authority of the Vedas (Nāstiko Vedanindakaḥ).'[7] In this context, it is worth noting that the earliest extant philosophical compendium of Indian philosophy, the *Ṣaḍdarśana-Samuccaya*, was prepared by the Jaina scholar Haribhadra Sūrī (A.D. 528). His commentator Guṇaratna (fourteenth century A.D.) maintains:

> ...the only significance we can attach to the word '*āstika*' is a belief in the reality of Ātman, of *saṁsāra* (cycle of births and deaths), and of *mokṣa* (salvation) and the path to realize it (*mokṣa-mārga*). According to this interpretation, the *darśana* that could be trully called *nāstika* is the Cārvāka, and partially that school of Buddhism which emphasizes Anātmavāda (the doctrine that there is no Ātman or Self).[8]

At this point the Jain position seems to exclude the Buddhists but there is also a common Buddhist-Jain position which excludes only the Cārvākas. It is clear from the standard statement on what a *nāstika*:

> ... in the Indian philosophical tradition a *nāstika* or non-believer is not necessarily the person who is an atheist. There are at least two philosophical schools within Hinduism which do not admit the existence of God. The Jainas and the Buddhists are heretical thinkers not because they are atheistic, but because they reject the authority of the Vedas and the Upanishads. According to these thinkers a *nāstika* or non-believer is one who does not believe in future life. This description of *nāstika* actually amounts to this, that a *nāstika* or a non-believer in the true sense is the person who denies the distinction between *dharma* and *adharma*, right and wrong' [namely, the Lokāyatas].[9]

Even when the religious climate of India became heavily theistic in medieval times, no suggestions were made that theism, rather than Vedic authority, be regarded as the test of orthodoxy. Vijñānabhikṣu (A.D. 1550) held the view that any Śāstra that 'admits a soul is authoritative nor is there any contradiction, each *śāstra* being in full force and true in its own sphere'. Thus, Vedic authority is virtually replaced by scriptural authority, any scriptural authority virtually functioning as a test of orthodoxy.

It is clear, therefore, that, while acceptance of Vedic authority is the most usually cited test of orthodoxy; this particular test may hold for orthodoxy within Hindu thought though the test tends to change in the context of Indian thought; that even in Hinduism it is rather the negative test of rejection of Vedic authority which seems to be more significant than an assertion of acceptance; and that the assimilation of the so-called heterodox sects within the orthodox is not unknown. Abbé Dubois, for instance, lists the following six schools (*Shan Mata*): (1) *Śaiva*, (2) *Śakta*, (3) *Charvake*, (4) *Kapalika*, (5) *Vaishnava*, (6) *Bouddha*. And he lists the 'different forms of knowledge taught in these schools as Nyaya etc.'[10]

II

It is clear that Vedic authority is the test of orthodoxy; but is it clear what Vedic authority means? It should be noted that the acceptance of Vedic authority is formal; what is its content? The Vedas constitute an enormous corpus; and even if we take the narrow view, as Troy Wilson Organ seems to, that adherence to the Upaniṣads (rather than the Vedas) was the 'test of orthodoxy',[11] even then, as S. Radhakrishnan notes:

> So numerous are their suggestions of truth, so various are their guesses at God, that almost anybody may seek in them what he wants and find what he seeks, and every school of dogmatics may congratulate itself on finding its own doctrine in the sayings of the Upanishads.[12]

In the same spirit the *Mahābhārata*,[13] the *Rāmāyaṇa*[14] and the works of the Āḻvārs[15] came to be considered on par with the Vedas. The Vedas from a text virtually became a symbol of spiritual authority. This may have led to a search for a doctrinal rather than textual identity.

Signs of a doctrine-oriented test of orthodoxy are not absent in Hinduism, but they have typically been developed either by outsiders to the tradition or sectarians within the tradition. Alberuni, the Muslim savant of the eleventh century, for instance, clearly identifies belief in rebirth as the hallmark of Hinduism (though not, one may note, of orthodoxy as such):

> As the word of confession, 'There is no god but God, Muhammad is his prophet', is the shibboleth of Islam, the Trinity that of Christianity, and the institute of the Sabbath that of Judaism, so metempsychosis is the

shibboleth of the Hindu religion. Therefore he who does not believe in it does not belong to them, and is not reckoned as one of them.[16]

On the other hand, one finds a doctrinal test of (sectarian) orthodoxy emerging in the context of the northern and southern schools of South Indian Śrīvaiṣṇavism, the former combining grace with self-effort and the latter relying on grace alone to secure salvation, positions often compared to the Pelagian and the Augustinian in a Christian context. Pillai Lokācārya is a well-known exponent of the southern school, who

> To show his contempt for those who rely on themselves, coins a new phrase for them. The word *asti* is the third person singular, present indicative of the verb *as,* meaning 'to be'. *Āstika,* therefore, is one who says, 'It is' or 'He is'. It usually refers to one who believes in God or in a world beyond this. *Nāstikas* are those who deny that God exists: that is, atheists. Those who rely on their own efforts are, says Lokachari, *āstika nāstikas,* nominal believers but real unbelievers; and he observes, 'The pure atheists (*kevala nāstikas*) may reform, but not the *āstika nāstikas*'.[17]

The tradition as a whole, however, seems to have been content with a formal test of orthodoxy, that of acceptance of Vedic authority. The requirement, given the interpretive elasticity of the Vedas, may seem only nominal; but in a religious tradition, without anything else to hold it together intellectually, such nominal acceptance seems to have had a very real role to play in view of the proverbial Hindu tolerance.[18] The role of Vedic authority is a matter of polemics among schools of Hindu thought, its general acceptance notwithstanding. For instance, the Viśiṣṭādvaitins criticize the Advaitin doctrine of *māyā* on the ground that it compromises the authoritative nature of the Vedas by making their status indeterminate like that of *māyā* itself of which they are a part.[19] The Mīmāṁsakas are similarly called 'deniers of Brahman' ('Brahmanāstikas') at times by the Advaitins.[20]

III

Could it be that, if orthodoxy is a matter of form rather than content, then the proper Western concept for *āstikya* is not orthodoxy but orthopraxy. At first sight, greater rigidity seems to be associated with orthopraxy in Hinduism than orthodoxy. One may believe what one likes, but breaking of a caste rule could mean excommunication. Thus, Troy Wilson Organ suggests:

> Hinduism, by reason of its long tradition of intellectual tolerance, has escaped the pitfalls of orthodoxy; it has not fared so well in the area of right acting. Orthopraxy with its rigid ceremonies and casuistic morality has often been the pattern of Hindu life. [And] unfortunately, Hindus have sometimes overstressed legalities and have neglected the wise observation

> of the *Mahabharata* that exactness in these areas remains a dark and uncertain quality: 'The truth about religion and duty is hid in caves.'[21]

A closer look reveals, however, that not only have Hindu practises been almost as varied and wide-ranging as Hindu doctrines, like them they have also changed over time.[22] An obvious piece of evidence in support of this may be adduced. *Śrauta* and *Smārta* are two kinds of Vedic rites. '*Śrauta Karmas* are those rites which are ordained in the *śruti. Smārta Karmas* are those which are learned from the *smṛtis* but which are supposed to have been enjoined by *Śruti,* a text lost to us.'[23] This is clearly a device to accommodate new ritual practises within the Vedic framework.

It should also be realized that movement of people in India has been as free as the movement of ideas. Abbé Dubois, the French scholar of the nineteenth century, remarked during his travels in South India about Indians:

> ... every native of India is quite free to take up his abode wherever it may seem good to him. Nobody will quarrel with him for living his own life, speaking what language he pleases, or following whatever customs he is used to. All that is asked of him is that he should conform generally to the accustomed rules of decorum recognized in the neighbourhood.[24]

The overall picture drawn by Abbé Dubois is helpful here:

> There is no place in India which does not possess certain customs and practices of its own, and it would be impossible to give descriptions of them all. Fundamentally, however, caste constitutions are the same everywhere. Furthermore, however many the shades of difference between the various castes, however diversified the customs that control them, only slight differences exist between the various forms of religious belief. Indeed, the religion of the Hindus may be said to form a common centre for the numerous elements which constitute Hinduism in its widest sense. Moreover there is a certain general uniformity of rule and practice in everyday social matters, which compels one to look upon the different masses of the population as belonging in reality to one big family.[25]

The problem with accepting orthopraxy in place of orthodoxy is that like the philosophical views usages also vary and have changed over time. And the discarding of outdated practises is openly recommended.[26] Thus, orthopraxy fares no better than orthodoxy in terms of fixity. However, the really important point to note here is that Vedic authority is also upheld in the matter of orthopraxy. Thus, P.V. Kane notes that 'usages of countries, castes, families [are] declared by Gautama and Manu to be authoritative if not directly opposed to the Veda',[27] just as in the realm of doctrine 'it was at the most necessary to show that the doctrines put forth by reasonings were not directly opposed to the dicta of the Veda'[28]

IV

Further investigation reveals that even the simple statement that there are six orthodox schools of Hindu philosophy conceals several problems.

(1) The figure of six needs to be first examined. 'In many passages of the Buddhist Scriptures we read of six unorthodox teachers',[29] though all are not described as *natthiya* (*nāstika*).[30] The expression may be significant when considered in the light of the fact that, as opposed to the six unorthodox teachers in Buddhism, Hinduism came to speak of six orthodox schools. Moreover, in relation to the first compendium of Indian philosophy, the *Ṣaḍdarśana-Samucaya* of Haribhadra

> ...it is curious to observe that in Haribhadra's time the number six of the Darśanas was already firmly established. For, after describing the (1) Bauddha, (2) Naiyāyika, (3) Sāṃkhya, (4) Jaina, (5) Vaiśeṣika, and (6) Jaiminīya systems, he remarks, that if some consider the Vaiśeṣika not altogether different from the Nyāya, there would be only five orthodox systems (Āstika), but that in that case the number six could be completed by the Lokāyita [*sic*] system which he proceeds to describe, but which, of course, is not an Āstika, but a most decided Nāstika system of philosophy.[31]

It should be noted that Haribhadra, being a Jaina, includes not only Jaina but the Baudhha school as well as one of the six orthodox schools. It needs to be further noted that the 'six systems' 'never attained the position of an exclusive, dogmatic orthodoxy'[32] as such standard texts as *Sarvadarśana-Siddhānta-Saṅgraha* (eleventh century A.D.) and the *Sarvadarśana-Saṅgraha* (fourteenth century A.D.) do not confine themselves to that number in their exposition of 'orthodox' positions.[33] Moreover, it is easy to see how the six systems of Hindu philosophy could be easily converted into six systems of Indian philosophy. There is a well-established tradition which hyphenates the six orthodox schools of Hindu philosophy as Nyāya-Vaiśeṣika, Sāṅkhya-Yoga and Mīmāṁsā-Vedānta.[34] If these be considered as single units and the three unorthodox units—the Cārvākas, Jainas and Buddhists—be added to them, we end up with the figure six again; but this time it encompasses not just Hindu but Indian philosophy.

(2) The question as to when did the six schools of Hindu philosophy in the standard listing become recognized as orthodox is difficult to answer. Vācaspati Miśra in A.D. 841 'composed commentaries on the Sāṅkhya, Yoga, Mīmāṁsā, Vedānta and Nyāya systems while Udayana, about a century later, combined the views of the Nyāya and the Vaiśeṣika in his proof of the existence of God'.[35] Thus, it appears that by the ninth/tenth centuries A.D. the six schools had come to be regarded as orthodox. However, Bhīmācārya in his *Nyāyakośa* [date?] cities Sāṅkhya and Advaita Vedānta as systems

which do not follow the Vedic path and Kumārila (*c* A.D. 700) 'regards the Sāṁkhya, the Yoga, the Pāñcarātra and the Pāśupata systems as being opposed to the Veda as much as Buddhism' (*Tantravārttika* i.3, 4).[36]

(3) One must also consider the question: can there be six orthodox systems? Normal expectation would lead one to the hope that one system would be considered orthodox.

As Max Müller observes:

> [The] Hindus themselves make indeed a distinction between the six orthodox systems, *they have no word for orthodox*; nay, we saw that some of these systems, though atheistic, were nevertheless treated as permissible doctrines because they acknowledged the authority of the Veda. Orthodox might therefore be replaced by Vedic....[37]

The significance of this simple suggestion is manifold and cuts in several directions. The first is scriptural. Orthodoxy means acceptance of Vedic authority. But what does such acceptance entail? A.B. Keith, remarking on the relationship of Nyāya and Vaiśeṣika to the Vedas, says:

> The systems are indeed orthodox and admit the authority of the sacred scriptures, but they attack the problems of existence with human means, and scripture serves for all practical purposes but to lend sanctity to results which are achieved not only without its aid, but often in very dubious harmony with its tenets.[38]

S. Radharkishnan remarks that 'what Keith says of the Nyāya and the Vaiśeṣika is true of the other systems as well'.[39] But even such an orthodox scholar as Kumārila is prepared to 'admit that the Buddhist systems owe their inspiration to the Upaniṣads, argues that they were put forth with the purpose of checking the excessive attachment to sensuous objects, and declares that, they are all authoritative systems of thought'.[40] His endorsement of the Buddhists is not without reservations,[41] but his remarks indicate a flexibility in interpretation of Vedic authority and a willingness to focus on morality rather than metaphysics which seems to require a liberal interpretation of Vedic authority.

The second point is doctrinal. Are the six systems to be treated as, in some sense, constituting a unified system? That at least some systems were so considered is indicated by the way they were paired off. The situation regarding the six systems as a whole is summarized by Max Müller thus:

> The Hindus themselves were fully aware that some of their systems of philosophy differed from each other on essential points, and that some stood higher than others. Madhusūdana clearly looked upon the Vedānta as the best of all philosophies and so did Śaṁkara, provided he was

> allowed to interpret the Sūtras of Bādarāyaṇa according to the principles of his own unyielding Monism. Madhusūdana, as we saw, treated the Sāṁkhya and Yoga by themselves as different from the two Mīmāṁsas, Nyāya and Vaiśeṣika, and as belonging to Smriti rather than to Sruti. Vijñāna-Bhikshu, a philosopher of considerable grasp, while fully recognising the difference between the six systems of philosophy, tried to discover a common truth behind them all, and to point out how they can be studied together, or rather in succession, and how all of them are meant to lead honest students into the way of truth.[42]

The third point is practical. If Vedic authority is as uncertain as it may be made to appear as a measure of orthodoxy, could it be that *orthopraxy* is the key concept for Hinduism?

These points are elaborated in the sections which now follow.

Vedic authority does then function notionally as the counterpart to the idea of orthodoxy. Some have maintained:

> In the final analysis, the orthodoxy of India has never been grounded in a college or academy. Neither can it be defined by any numbering of views. For its life is in the mokṣa of the actual sages: such, for example, as Rāmakrishna (1836-86) in the nineteenth century and Ramana (1879-1950) in our own. These 'wild geese' (hamsas), teaching numerously in every part of the land of the Bharatas, have renewed the ineffable message perennially, in variable terms, which philosophers classify and adhikārins transcend.[43]

I think this is an overstatement. For these sages themselves often show reverence for the Vedas.[44] But the statement does draw attention to the fact that the saints are the 'generating centres of Hindu religion'[45] which may be a modern way of saying what Ānandagiri (thirteenth century)tells in the idiom of medieval scholasticism when he states in reference to the great teachers and saints: '...such an enlightened person does not become a bondslave of the Veda. The meaning that he gives to the Veda, that alone becomes the meaning of the Veda.'[46]

In the following are a few factors which make Vedic authority less than rigid in the context of Hinduism:

(*i*) Hinduism, as is often stated, is an ethnic rather than a credal religion.[47] The full significance of this will be examined later, but it should suffice at this stage to point out that, if the test of the membership of a group is ethnic rather than credal, orthodoxy *per se* becomes devalued in that tradition, for creed ceases to be as important as in the primarily credal religions.

(*ii*) It is generally acknowledged that Hinduism as a religious tradition has a somewhat mystical bias.[48] This again serves to undercut the importance of orthodoxy which tends to be more important for religions with a positivistic, a dualistic or a rationalistic bias.

(*iii*) Parts of the Hindu religious tradition emphasize the role of experience over the Vedas.[49] As in the former case, this could also serve to reduce the role of orthodoxy.

(*iv*) The definition of the Vedas itself is a matter of controversy; then there is the further controversy regarding which part of it is of primary significance, finally, even when the Upaniṣads are acknowledged as the most significant part, there is a controversy regarding their correct interpretation. This situation is not without parallel in other religions. Thus, the Protestants do not accept the Catholic Bible in its entirety, and the proliferation of protestant denominations testifies to variability in Christian interpretation. The Hindu case, however, is marked by a greater degree of differences in this regard.

(*v*) The Hindu religious tradition is quite capable of either changing its mind as to whether a particular school or sect has fallen outside the pale of Vedic authority or of allowing others to change their own mind in this respect. Modern Hindus, unlike their ancient forebears, do not tend to exclude Buddhism,[50] while several schools and sects such as the Vaiśeṣika,[51] Pāśupata,[52] Vīraśaivas,[53] etc. which started out somewhat dubiously in relation to Vedic authority became anchored ultimately within the tradition.

(*vi*) Not only Hindu but Indian philosophy is 'characterized by the introspective attitude and the introspective approach to reality';[54] thus, the 'subjective rather than the objective, becomes the focus' and it is easy to see how orthodoxy would have less applicability in a tradition more subjective rather than objective in orientation.

(*vii*) The definition of Hindu orthodoxy in terms of the Vedas has its limitations since Vedic revelation was, in fact, not accessible to classes below the top three[55] and to women in classical Hinduism, so that tradition rather than revelation played a much more important role. But such tradition was believed to be in line with revelation.

The issue then is this. The concept of orthodoxy clearly exists as its analogue Vedic authority suggests, but it lacks the definition, fixity and clarity one tends to associate with it in the West. How is this to be accounted for?

Perhaps the answer is to be found in the suggestion by Simmel:

> [In the sociology of religion we must] 'make a basic distinction between two types of religious organisation'. In the first case [he instances many primitive religions], a common God grows out of the 'togetherness' of a unified group. In the second case, and he suggests Christian sects provide good example, it is the concept of the God itself which unites members who may indeed have little else in common.[56]

Similarly, Lenski distinguishes 'between the "communal" and the "association" aspects of religion, the former focusing on networks of relationships and patterns of residence among religious adherents, the latter involving their degree of involvement in the Church as a specific institution of worship'.[57]

Where is this excursion into the sociology of religion leading to, one must wonder. It is leading to the suggestion that in the case of some religions the community comes first and the beliefs and practises later; and that in the case of other religions the beliefs and practises come first and the community is formed around them. The Hindu religious tradition seems to belong to the former class in which the requirements of orthodoxy tend to be more lax than in the latter.[58] What sounds tautological is perhaps a sound sociological fact: that Hinduism is the religion of the Hindus. The Hindus come first and then try to figure out what it means to be one. At one stage in their history most chose to define their identity *vis-á-vis* those who excluded themselves from their community in terms of the acceptance of the Vedas. The criterion then is, firstly, of membership of the group rather than orthodoxy. Even here the issue involved is subtler than what it appears to be at first sight. The standard statement is that the orthodox schools of Indian thought accept the Vedas while the non-orthodox schools reject them. But let us step a bit behind the Vedic tradition and such traditions as Buddhism and Jainism which are opposed to it. If for a moment we disregard the *apauruṣeya* claim, then behind the Vedas stand the *ṛṣis* or seers, and behind Buddhism and Jainism stand their own individual founders.[59] Thus, while on the face of it the Vedas represent external authority, it is obvious:

> ... that scriptural truth also should at first have been known by some human means—through direct intuition, if not reasoning. If the śruti also thus represents the intuitive experience of ancient sages and is pauruṣeya, it may seem hardly different from the heterodox āgama. But we may deduce a distinction between the two from a fourth condition sometimes laid down (cf. *Kusumāñjali,* ii.3 and SV. p. 90) that the revealed truth should have proved acceptable to the general mind of the *community* (mahājana-parigraha), or that it should be in harmony with what may be described as race-intuition. It is this sanction of the community in general that in the end seems to distinguish orthodox śruti from heterodox āgama.[60]

The role of the community has once again been decisive.[61]

V

The foregoing discussion suggests the following conclusion. It is generally believed that acceptance of Vedic authority is the test of orthodoxy in Hinduism. Further investigation reveals that such a view is difficult to sustain historically or philosophically with consistency. Such inconsistency arises out of the fact that Hinduism is the kind of religion in which communal identification *precedes* doctrinal definition. In other words, one begins by first identifying a Hindu and not by defining Hinduism. Thus, Hindu self-definition holds the key to orthodoxy rather than orthodoxy being determinative of Hindu

self-definition. Such self-definition is a variable. Hindu sociology here provides the clue for a proper understanding of the concept of orthodoxy in Hindu philosophy.

Notes and References

1. T.M.P. Mahadevan, *Outlines of Hinduism,* Bombay, Chetana Ltd., 1971, p. 99.
2. V.S. Agrawala, *India as Known to Panini,* Varanasi, Prithvi Prakashan, 1963, p. 392.
3. See Wm. Theodore de Bary (ed.), *Sources of Indian Tradition,* Vol. I, New York, Columbia University Press, 1958, p. 39.
4. Haridas Bhattacharyya (ed.), *The Cultural Heritage of India,* Vol. I, Calcutta, The Ramakrishna Mission Institute of Culture, 1958, p. 310.
5. *Ibid.,* p. 389.
6. N.K. Devaraja, *Hinduism and the Modern Age,* New Delhi, Islam and the Modern Age Society, 1975, p. 15.
7. Haridas Bhattacharyya (ed), *op. cit.,* Vol. I, p.3 89.
8. *Ibid.,* p. 415.
9. N. K. Devaraja, *op. cit.,* p. 15.
10. P.V. Kane, *History of Dharmaśāstra,* Vol. V, Pt. II, Poona, Bhandarkar Oriental Research Institute, 1977, p. 976.
11. Troy Wilson Organ, *Hinduism: Its Historical Development,* Woodbury, New York, Barron's Educational Series, Inc., 1974, p. 101.
12. *Ibid.*
13. Subhadra Upanhyaya (ed.), *Bhagavadgītā Bhāṣya* by Bhaskara, Varanasi, Varanaseya Sanskrit Vishvavidyalaya, 1965, p. 24.
14. See Chap. on 'Rama' in *Sankara and Shanmata,* Madras, M.L.J. Press Private Ltd. and Kalki Press, 1969.
15. P.N. Srinivasachari, *The Philosophy of Viśiṣṭādvaita,* Adyar, Madras, The Adyar Library and Research Centre, 1970, pp. 431-32.
16. Ainlie T. Embree (ed.), *Alberuni's India,* New York, W.W. Norton & Company, 1971, p. 50.
17. Sabapathy Kulandran, *Grace: A Comparative Study of the Doctrine in Christianity and Hinduism,* London, Butterworth Press, 1961, p. 251.
18. Some Scholars regard this tolerance as not really belonging to the nature of Hinduism but forced on it by history. Thus, Benjamin Walker writes in *The Hindu World,* Vol. II, (New York, Frederick A. Praeger, 1968, p. 127): 'Indian materialism and rationalism, as exemplified in the theories of nāstika thinkers appear to have played a great and liberating part in the development of Indian thought, a fact which has been immensely neglected by students of Hindu philosophy. Indian nonconformity is one of the finest chapters in the history of Hindu and Buddhist speculation. For centuries, in spite of the severest restrictions of a rigid orthodoxy, India continued to produce schismatics and protestants, dissenters and rebels, who shook orthodoxy mould owing to the ceaseless attacks on the citadels of its faith from all sides by these agnostics, and it is this more than any other single factor that has contributed to the elasticity of the Hindu organism. The catholicity of Hinduism in fact comprises precisely that aspect of the religion that is most distasteful to orthodox Hindus, although their apologists sometimes speak of it as though they had a hand in the matter themselves or as if they welcomed this latitudinarianism.'
19. See A.M. Srinivasa Chari, *Advaita and Viśiṣṭādvaita,* Delhi, Motilal Banarsidass, 1976. p. 25; K. Satchidananda Murty, *Revelation and Reason in Advaita Vedānta,* New York, Columbia University Press, 1959, pp. 99-102.

20. M. Hiriyanna, *Outlines of Indian Philosophy*, London, George Allen & Unwin, 1964, p. 337, fn. 1.
21. Troy Wilson Organ, *The Hindu Quest for the Perfection of Man*, Athens, Ohio, Ohio University, 1970, pp. 209-10.
22. This has been documented by P.V. Kane, *op. cit.*, Vol. V, Pt. II, p. 1264, ff.
23. T.M.P. Mahadevan, *op. cit.*, p. 40, fn. 1.
24. Abbé J.A. Dubois, *Hindu Manners, Customs and Ceremonies*, Henry K. Beaucamp (tr.), Oxford, Clarendon Press, 1959, p. 12.
25. *Ibid.*, p. 11.
26. P.V. Kane, *op. cit.*, Vol. V, Pt. II, pp. 1270-71.
27. *Ibid.*, Index, p. 230.
28. *Ibid.*, p. 1482.
29. Wm. Theodore de Bary (ed.), *Sources of Indian Tradition*, Vol. I, New York, Columbia University Press, 1958, p. 39. But also see K.N. Jayatilleke, *Early Buddhist Theory of Knowledge*, London, George Allen & Unwin Ltd., 1963, p. 140.
30. T.W. Rhys Davids (tr.), *Dialogues of the Buddha*, London, Oxford University Press, 1877, p. 65ff. Also see Bhikkhu Bodhi (tr.), *The Discourse on the All-Embracing Net of Views*, Kandy, Buddhist Publication Society, 1977, p. 176, 200-1.
31. F. Max Müller, *The Six Systems of Indian Philosophy*, London, Longmans, Green and Co., 1928, p. 439.
32. Heinrich Zimmer, *Philosophies of India*, Joseph Campbell (ed.), Cleveland, Ohio, Meridian Books, 1964, p. 613.
33. *Ibid.*, pp. 613-14.
34. *Ibid.*, p. 605 ff. Also see M. Hiriyanna, *The Essentials of Indian Philosophy*, London, George Allen & Unwin Ltd., 1949, *passim*.
35. Heinrich Zimmer, *op. cit.*, p. 612.
36. S. Radhakrishnan, *Indian Philosophy*, Vol. II, London, George Allen & Unwin, Ltd., 1927, p. 20-21.
37. F. Max Müller, *op. cit.*, p. 450.
38. See S. Radhakrishnan, *op. cit.*, p. 21.
39. *Ibid.*
40. *Ibid.*, p. 20.
41. P.V. Kane, *op. cit.*, Vol. V, Pt. II, p. 1262. Also see pp. 926, 1260 and 1263.
42. F. Max Müller, *op. cit.*, p. 450.
43. Heinrich Zimmer, *op. cit.*, p. 614.
44. Nalini Devdas, *Sri Ramakrishna*, Bangalore, The Christian Institute for the Study of Religion and Society, 1966, pp. 114-15; *Talks with Sri Ramana Maharshi*, Tiruvannamalai, Sri Ramanasraman, 1972, pp. 137-38.
45. Thomas J. Hopkins, *The Hindu Religious Tradition*, Belmont, California, Dickenson Publishing Company, Inc., 1971, p. 139.
46. Quoted in T.M.P. Mahadevan, *Gauḍapāda: A Study in Early Advaita*, University of Madras, 1960, p. 93.
47. A.L. Basham, 'Hinduism' in R.C. Zaehner (ed.), *The Concise Encyclopedia of Living Faiths*, Boston, Beacon Press, 1959, p. 225. One might even say that it is a cultural rather than a credal religion.
48. S. Radhakrishnan, *The Hindu View of Life*, New York, The Macmillan Company, 1927, pp. 26-28. Not only is there a mystical bias in Hindu philosophy, it has also been pointed out that such mysticism tends to be monistic (see A.L. Basham, 'Hinduism' in R.C. Zaehner (ed.), *The Concise Encyclopedia of Living Faiths*, Boston, Beacon Press, 1959, p. 225. This aspect reinforces the non-rigidity of the tradition (see S. Radhakrishnan and Charles A. Moore (eds.), *A Source Book of Indian Philosophy*, Princeton, New Jersey, Princeton University Press, 1971, p. xxv).
49. *Bṛhadāraṇyaka Upaniṣad* 4.3.22. See K. Satchidananda Murty, *Revelation and Reason in Advaita Vedānta*, New York, Columbia University Press, 1959, pp. 99-102; but also see Pt. II, Chap. IV and pp. 51-52.

50. For an interesting discussion of this point, see Hendrik Kraemer, *World Cultures and World Religions: The Coming Dialogue*, Philadelphia: The Westminster Press, 1960, pp. 70, 156 f., 163, 232, 300.
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61. The concept of *Apauruṣeya* can also be connected with that of the community. The general Hindu idea that the Vedas have no author could be construed as an attempt by the Hindu community to avoid what philosophers refer to as the genetic fallacy, albeit by having recourse to a mythical approach.

Heideggerian retrieval of Cartesianism*

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Heidegger's concern for both hermeneutics and history of philosophy is quite well known; these two, in fact, are closely related. For Heidegger assuredly is not interested in history as the record of past incidents or ideas merely, but wants to recollect them for reassessing their values from his own socio-cultural milieu and phenomenologico-existential perspective. This is evident from his discussion of Aristotle and Descartes, Kant and Husserl. In his voluminous writings, we often find the recurrence of Descartes or of Cartesianism; sometimes he detects its limitations and seeks to remedy them; while in other cases Heidegger digs out its tacit dimensions in order to reveal its significance for the contemporary 'world picture'. In the present essay, an attempt will be made to explore both these aspects (primarily from Heidegger's own writings) which will gradually delineate Heidegger's retrieval of Cartesianism.

It is quite evident that both in his thought and praxis Heidegger has given much importance to history. It is clear that in his hermeneutical phenomenology he has stressed the role of history, both synchronic and diachronic. In his philosophic career we notice that Heidegger, unlike many other creative and original thinkers, often refers to and reconstructs (and sometimes destructed too) many major landmarks of philosophy and science. He discusses not only his immediate predecessors but also retraces and retrieves the views of Heraclitus and Parmeneides, Plato and Aristotle, Galileo and Newton, Descartes and Kant, Hegel and Nietzsche. He is interested in history or in the makers of history not merely as chronicle of events or succession of ideas; the mode of historicity helps him to deepen his basic *Weltanschauung*.

In Heidegger's major works, written during the earlier part of his career, *e.g.*, in *Being and Time* (the first German edition published in 1927) and in *The Basic Problems of Phenomenology* (the first German edition published in 1975), he clearly expressed his dissatisfaction with Cartesianism for the latter's inability to do full justice to the notion of Being as such, and Heidegger himself wanted to supplement it with his fundamental ontology. But as we reflect on various articles and lectures delivered by Heidegger towards the later part of his life, we can notice a sort of *kehre*, a transformation, not only in Heidegger's own attitude towards phenomenology as is commonly held but also in his own assessment of Descartes. For in these later works one may

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The paper is dedicated to Martin Heidegger on his birth centenary year.—KRISHNA ROY

not detect such severe criticisms which one perceives in his earlier works; rather, here we mark a fresh evaluation or even reappraisal of Cartesianism in the light of modern scientific development.

In his *What Is a Thing*? (first published in 1962) and in *The Question Concerning Technology and other Essays* (lectures delivered during 1952-62), we find that Heidegger describes Descartes as the advent of a new spirit in both science and philosophy. Here he not only represents Descartes as the liberator from bondage and tradition but also hermeneutically reconstructs Cartesianism as the fulfilment of an incipient metaphysical urge. He gradually reveals how with Cartesian inspiration man, once determined to investigate and behold the truly real, finds himself in that self-certainty to be more and more the determining centre of reality. In such Cartesian shift towards man's self-assurance Heidegger sees the dawn of the *Neuzeit*.

I

From a cursory look at Heidegger's *Being and Time*, his *magnum opus*, it may appear that he is mainly interested in showing his departure from Cartesianism; but a deeper deliberation will certainly reveal that what is aimed at here is not merely criticism or destruction of Cartesian views; rather, he is hermeneutically reconstructing those Cartesian ideas in order to explore their significance for the ontico-ontological description of the Being-in-the-world or the Dasein. In fact, the relation between Heidegger and Descartes may be described metaphorically as a love-hate relationship. Heidegger may not accept certain key-concepts of Cartesianism; yet he exposes some of its new, fruitful implications from his own existential standpoint.

It is evident that the concept of subjectivity that links up Cartesianism with Husserlian phenomenology is not the cardinal point that bridges the gap between Descartes and Heidegger. Heidegger is, in fact, a bit hesitant even to admit the reputation that has so long been credited to Descartes for contributing the concept of subjectivity to posterity. Instead of giving primacy to consciousness like Descartes, he in his hermeneutic phenomenology gives primacy to the Dasein.

Being fascinated by the Parmenidean problem of Being, Heidegger, during the earlier days of his life, became interested in Brentano's dissertation 'On the Manifold Meaning of Being According to Aristotle'. Gradually he realized that the question of the meaning of Being was not only elusive and ambiguous, but in the traditional metaphysics the problem had not been properly pursued even. In order to accomplish this indispensable task, Heidegger wanted to discuss the meaning of Being. It is not that in traditional metaphysics the question of Being has not been raised. This question, on the contrary, has emerged from time to time in different periods. But what was really lacking, according to Heidegger, in those ontological analysis was that there the main meaning of Being had not been fully explored; rather, those ontological accounts accepted the Being of beings as being-present-at-hand.

In his sojurn of the history of philosophy, Heidegger bemoans that the entire history is primarily oriented towards the subject. This is true not only of the modern period, initiated by Descartes, but also of the ancient period. Even in the apparently objectivistic Greek ontology the role of the subject has been emphasized. The Parmenidean Being was identical with thinking; even for Heraclitus Being was comprehensible only through *logos, i.e.*, thought. While interpreting the modern philosophical tradition in his *The Basic Problems of Phenomenology*, Heidegger maintains that Descartes in the modern period giving 'active stress upon the subject' only 'sharpens what the ancients sought'. He thinks that Descartes has interpreted the subject's Being under the guidance of the concept of Being and its partinent categories as developed by ancient and medieval philosophy. Descartes' fundamental ontological principles were directly drawn from Suarez, Duns Scotus and Thomas Aquinas. By showing the link with the traditional metaphysical problem, Heidegger explains how the Cartesian revolution in modern period has failed to be a true revolution at all. And he further criticizes that 'by this allegedly critical new beginning of philosophy in Descartes the traditional ontology was taken over'.[1]

Heidegger, however, is not blind to the contribution of Descartes as giving a 'genuine impulse towards philosophical inquiry'; yet the Cartesian project has failed (according to him) for it did not spring directly from insight into the fundamental-ontological function of Dasein. The motive of the primary orientation towards the subject that we find in the entire post-Cartesian period is the opinion that this Being, which we ourselves are, is given to the knower first and as the only certain thing; that the subject is accessible immediately and with absolute certainty; that it is better known than all objects, which, in comparison, are known only mediately and with lesser certainty. Heidegger thinks that from this 'pre-eminence of the subject' it may be expected that ontology would now take the subject as 'the exemplary entity', and the subject's way of Being would gradually culminate in the ontological question. But here he becomes utterly disappointed as this expectation has not been fulfilled, and he realizes:

> ... the motives for modern philosophy's primary orientation to the subject are not fundamental-ontological. The motive is not to know precisely *that* and *how* being and being's structure can be clarified in terms of the Dasein itself.[2]

In his *Being and Time*, Heidegger discusses the insufficiency and incompleteness of Cartesianism. The Cartesian project of investigating the *cogitare* of the 'ego' is regarded by Heidegger as insufficient as it works only 'within certain limits'. Besides, he is critical of Descartes in so far as the latter has left the '*sum*' completely undiscussed, even though it is regarded as no less primordial than the *cogito*. In place of supporting Cartesian philosophic inquiry,

Heidegger suggests that 'our analytic raises the ontological question of the Being of the "*sum*". Not until the nature of this Being has been determined can we grasp the kind of Being which belongs to *cogitationes*.[3]

In Cartesianism we have noticed that the thinking or *cogitare* indubitably assures the existence of self or '*sum*'. This ego or '*sum*' is essentially a thinking substance—a *res cogitans*. The thinking being as subject stands apart from a world composed of objects which are diametrically opposites, i.e., *res extensa*. This Cartesian dualism of thinking substance and material substance has been interpreted as the distinction between a 'worldless subject' and a world of extended objects, for Descartes in his *Meditations* declares that subjects are substances. He also accepts that substances exist in such a manner that they have no need of any other thing in order to exist (except God), and this consequently shows that subjects may be totally independent of other worldly entities or in essence may be worldless. The material objects of the world, on the other hand, are equally independent, and this gradually paves the way for the dualism between the subject and the object, the worldless soul and the world of entities. Heidegger is thoroughly unhappy with such ontological dualism as in this project there is 'no success' in exemplifying the various modes of Being of the beings, thus labelled, taken particularly and in their 'diversity'. Such dualism also fails to fulfil the need for 'subordinating this diversity of being' as a multiplicity of ways of Being to an overarching concept of Being in general.

It should not be supposed, however, that Heidegger is unaware of the fundamental difference between the mode of Being of human beings and that of natural beings *qua* natural entities. He, therefore, employs the terms *Dasein* and *Existenz* for human beings and the term *Vorhandensein* for non-human beings. While accepting this distinction, Heidegger likes to supplement what he misses in traditional ontology, i.e., a deliberation regarding the meaning of Being in general. Hence his searching vision delves deeper into the realm of Being in general, which is commonly present in the Being of man and the Being of natural entities, i.e., the being that equals 'extantness'. He also repeatedly shows the distinction between 'existence', which is a mode of being of Dasein and 'extantness', which belongs to both realms of Being.

In addition to the distinction between existence and extantness, Heidegger also makes a distinction between the ontic and the ontological spheres. While the ontic sphere includes all beings or entities and the facts about them and may refer to real, unreal, imaginary or illusory beings, the ontological sphere is primarily concerned with Being. But any ontological inquiry would not satisfy Heidegger; rather, he is interested only in fundamental ontology, which establishes the necessary conditions under which ontologies of various realms of Being can have meaning.

Thus, Heidegger's intention is not merely to overcome the distinction between *res extensa* and *res cogitans*. His project is, firstly, to direct our attention to the original idea of Being in general, and secondly, to exemplify how

Dasein or the human being opens up or is thrown towards the world. He realizes that only the human being has the capacity of understanding-of-Being. This ability to open up, to be unveiled or become disclosed belongs to Dasein and makes possible this *Da* or Being-in-the-world.

> The entity which is essentially constituted by Being-in-the-world is itself in every case its 'there'.... This entity carries in its ownmost Being the character of not being closed off. In the expression 'there' we have in view this essential disclosedness. By reason of this disclosedness, this entity (Dasein), together with the Being-there of the world, is 'there', for itself.[4]

Cartesianism has been regarded as giving more emphasis on the cognitive aspect of man's consciousness, and since then Descartes has been regarded as the intellectual progenitor of that tradition where knowledge has been treated as the correlation of two entities, i.e., consciousness and nature, and this subject-object relation has become the presupposition of every cognitive theorizing. The impact of such dualism persisted throughout the modern period; and though many attempts have been made to overcome the gap, yet various modes of such dualism can be noticed even in the speculations of many contemporary thinkers. Even in Husserl, Heidegger's immediate predecessor, we can discern the presence of a similar duality in his distinction between Being as consciousness and the Being as manifesting itself through consciousness. Heidegger is generally regarded as the first successful philosopher, who could overcome the Cartesian distinction between subject and object. In fact, the basic thrust of Heidegger's thought, since the publication of *Being and Time* to the lecture delivered on *Time and Being*, has been an untiring struggle against this subject-object dichotomy. He insists that the whole idea of 'being-a-subject' and 'being-an-object' should be reassessed in the light of a fundamental ontology. In order to oppose the Cartesian tradition which has split off man from his world, Heidegger wants to reiterate man's inalienable involvement with the world and his Dasein. Being-in-the-world shows man's openness towards the world, its essential dwelling place.

Heidegger realizes that, due to such overemphasis on the role of the subject in the Cartesian tradition, its mode of Being is 'misunderstood' and the intentional character of Dasein goes neglected. In his *The Basic Problems of Phenomenology*, Heidegger explicitly admits the significance of the phenomenological notion of intentionality, developed by Brentano and Husserl. Heidegger relates this concept of intentionality to Natorp's notion of 'Consciousness' (*die Bewusstheit*) which also refers to the relation between the ego and its content. This notion of intentionality, he believes, belongs to the existence of Dasein. 'To exist then means ... *to be as comporting with beings* (*sich verhaltendes Sein bei Seiendem*). It belongs to the nature of the Dasein to exist in such a way that it is always already with other beings.'[5]

This phenomenological notion of intentionality is prior to all discussion

and proliferation about the subject-object correlation. It, rather, shows how Dasein gives itself over immediately and passionately to the world and how its own self is reflected on it from things. Elaborating this concept, he gradually reveals how intentionality is founded on Dasein's transcendence. Of course, transcendence, to Heidegger, is an existential concept and as such is 'a fundamental determination of the ontological structure of Dasein'.

Heidegger enlarges the 'contexture' of the content of our consciousness by showing that the being-in-the-world belongs to Dasein's existence. He says in this context:

> So far as the Dasein exists a world is cast-forth with the Dasein's being. To exist means, among other things, to cast-forth a world and in fact in such a way that with the thrownness of this projection, with the factical existence of a Dasein, extant entities are always uncovered.[6]

Heidegger's notion of world goes much deeper than that of Descartes. His world is not merely a being which is extant in itself. This world is a determination of Dasein's being, it is a part of Dasein's existential constitution. 'The world is, so to speak, Dasein-ish. It is not extant like things but it is *da*, there-here, like the *Dasein*, the being-*da* (das Da-sein) which we ourselves are: that is to say, it exists.'[7]

In considering the concept of world, Heidegger often looks back to the Cartesian conception of world as *res extensa*. The ontological characterization of this *res extensa* harks back to the idea of substantiality. The notion of substance is generally connected with independence, and we have three kinds of substances—one of them infinite, i.e., God and others, mind and matter—both finite. Heidegger repeatedly criticizes Descartes for the latter's negligence of the meaning of Being which this notion of substantiality embraces. In Cartesianism this meaning remains ambiguous and unclear, for it is held to be 'self-evident'. In Descartes and even in Kant, this question of Being, the originary concept, remains neglected as 'Being' does not 'affect' us, and can never be perceived in the way a substance can be perceived through its predicates.

Criticizing the Cartesian view on world Heidegger maintains in *Being and Time*: '...the entity which Descartes is trying to grasp ontologically and in principle with his 'extensio', is rather such as to become discoverable first of all by going through an entity within-the-world which is proximally ready-to-hand—Nature'.[8] Heidegger makes a distinction between nature and world and makes it clear that the world is nothing that occurs within the realm of the extant but belongs to the 'subject'; world, thus, is 'subjective', not in its traditional sense but in a special sense, so that the mode of Being of Dasein is consequently determined by way of the phenomenon of the world.

Heidegger further explains world-understanding as Dasein-understanding, and that basically means self-understanding. Unlike Cartesianism, self and world belong together to Heideggerian Dasein. Self and world are not two different entities like subject and object or like I and you; self and world are the basic determinations of Dasein itself in the unity of the structure of Being-in-the-world.

Heidegger objects that in the Cartesian conception of the 'Being of the world' the definite idea of Being remains veiled in the concept of substantiality and in terms of the idea of knowledge by which such entities are cognized. Descartes has only equated Being with 'constant presence-at-hand'. Hence Heidegger becomes convinced that 'his ontology of the world is not primarily determined by his leaning towards mathematics, a science which he chances to esteem very highly, but rather by his ontological orientation in principle towards Being as constant presence-at-hand, which mathematical knowledge is exceptionally well suited to grasp'.[9] This has led Descartes gradually to turn from the development of traditional ontology to modern mathematical physics and its transcendental foundations.

II

Like Descartes, Heidegger, too, is very much interested in the development of modern science, and becomes engaged in laying bare its true foundation and meaning. But not conforming to the rationalistic heritage, Heidegger becomes more influenced by Dilthey and Nietzsche, and is deeply perturbed by the unimpeded predominance of the scientific conceptions within modern culture. He fears that such unquestioned predominance may lead to obscurity and consequent forgetfulness of a phenomenologically more originative level of experience. In that gradually enveloping atmosphere of scientism and mathematization, Heidegger feels:

> What is questionable...is a closer determination of the relation of mathematics to the intuitive direct perceptual experience of the given things and to these things themselves. Up to this hour such questions have been open. Their questionability is concealed by the results and the process of scientific work.[10]

Heidegger expresses his views on modern science and culture in many of his later writings or lectures. In his lectures entitled 'What Is a Thing?' Heidegger explicitly discusses how modern science differs from ancient and medieval sciences. It is generally held that modern science starts with facts, while ancient science fiddled with speculative propositions and concepts. Accepting this as partially true, he shows that like its antecedants, modern science also works with concepts and theories. When we try to characterize science as factual, experimental and measuring science, we miss, according to Heidegger, another basic element. This is, what Heidegger describes, as mathematical projection.

Like Descartes and Heidegger's immediate predecessor Husserl, Heideg-

ger, too, was a serious student of mathematics and was fully aware of the development of the Galilean project of mathematization of nature. His competence and interest in mathematics is often being forgotten now-a-days, but the importance and ingenuity of Heidegger lies in not accepting the ordinary conventional meaning of 'mathematics'. The term 'mathematical', according to him, does not refer merely to that which pertains to numbers. Relating it to its Greek etymology *mathesis*, it has been extended to mean the learning process as such. He gradually explores this metaphysical meaning of the 'mathematical' in order to evaluate its importance for modern science and metaphysics. He believes that not only modern science and modern mathematics but modern metaphysics, too, bloom from the same stem of mathematics in this wider sense. Of all these three disciplines, Heidegger feels that 'because metaphysics...reaches farthest—to beings in totality and therefore it reaches deepest toward the Being of beings as such; therefore it is precisely metaphysics which must dig down to the bedrock of its mathematical base and ground'.[11]

While relating mathematics to metaphysics, Heidegger quite appropriately remembers the invaluable contribution of René Descartes to such a project. We all know that at the dawn of modern philosophy Descartes launched the project of the mathematization of physics; and finally he sought to found this mathematical physics on the secure basis of the self-certitude of the metaphysical principle. In his hermeneutics of the history of philosophy, Heidegger recapitulates how mathematics gradually emerged as the foundation of all thought. The importance and significance of Descartes lies in the fact that even being aware of the necessity of the mathematization and its allied precision and clarity he felt for the first time a need for 'reflection upon the fundamental meaning of the mathematical'. He realized that, since this reflection must concern itself with the 'totality of beings' and the knowledge of it', this had to become a reflection on metaphysics. Tracing this 'unfinished' and often-forgotton task of Descartes Heidegger remarks: 'This simultaneous advance in the direction of a foundation of mathematics and of a reflection on metaphysics above all characterizes his fundamental philosophical position.[12]

Heidegger further believes that the Cartesian method of doubt does not come out of his apparent scepticism, it is rather the outburst of his inherent urge to find mathematical clarity and certainty for all knowledge as such. Cartesianism endeavoures not merely to give us the fundamental law for the realm of nature but also to explore the 'very first and highest basic principle for the Being of beings in general....The Being of beings is determined out of the "I am" as the certainty of the positing'.[13] Thus, the Cartesian *mathesis* seeks to deduce its unshakable position from the *cogito* principle; and Descartes' quest of such self-grounding, hence absolutely certain foundation, makes the mathematical projection that of modern philosophy as a whole.

Heidegger's hermeneutic seeks to dig out the inherent implications of the Cartesian project. He acclaims the exploration of the mathematical by Galileo, Descartes and others as the anticipation of his own project. In his *What Is a Thing*? Heidegger elaborates how such mathematical exploration leads to the notion of the 'between', of that which is neither 'objective' scientific thing, nor the epistemic 'subject', but the 'clearing' within which man encounters the thing in the way that man encounters himself. In such a novel interpretation, the mathematical is a 'projected clearing' or 'horizon' within which man experiences things. Heidegger further interprets modern philosophy's turn to the mathematical as the beginning of 'new freedom' to human thought. Referring back to Cartesianism, he shows how the growing awareness of *mathesis* not only poses the question 'what is a thing?' but also inquires into the nature of human being. He explains that the understanding of the world remains incomplete and finite without having a proper understanding of man. Such emphasis on humanism and the consequent role of man in modern scientific culture can be noticed in many of his essays and lectures. What is interesting and illuminating here is that while discussing the role of man he often remembers Descartes, and this seeks to reveal a newer dimension of Cartesianism.

We all know that Descartes' interest in achieving mathematical certainty for all knowledge and giving stable foundation to modern science paves the way for objectivity and research in science. With the gradual development of such objective tendency in science and technology the role of man becomes either neglected or minimized. The tendency of scientism and mathematization threats to berate all humanistic dimensions. Heidegger's existential outlook is always antithetical to such a possibility of exact science and its allied enveloping dehumanization. In the articles and lectures delivered during the later part of his career, we explicitly mark his vehement criticisms of such neglect of man in the modern period. Rather, he forcefully wants to assert the role of man and his values.

In his lectures entitled 'The Age of the World Picture', we notice a detailed characterization of this *Neuzeit*. While delineating this age as the age of transition, where we continuously experience a tension between subjectivism and objectivism, Heidegger quite appropriately looks back to Descartes' contribution to the development of both these tendencies. We often hail Descartes as the father of subjectivism, but he may be regarded as the progenitor of the objective trend as well. Heidegger, in fact, is aware of both these interpretations of Cartesianism and reflects on this ambivalance between objectivism and subjectivism. In this context, we may recapitulate his very illuminative comment:

> Certainly the modern age has as a consequence of the liberation of man, introduced subjectivism and individualism. But it remains just as certain that no age before this one has produced a comparable objectivism and

> that in no age before this has the non-individual, in the form of the collective, come to acceptance as having worth. Essential here is the necessary interplay between subjectivism and objectivism.[14]

It is really interesting that in the Heideggerian hermeneutic of Descartes we find the exploration of both these aspects.

In his lectures, Heidegger seeks to reflect on the essence of modern science mainly to apprehend in it its metaphysical ground. He raises questions: what understanding of what is and what concept of truth provide the basis for the fact that science is being transferred into research? He gradually discusses how science as research has become the essential phenomenon of the *Neuzeit*, and here, too, he notices the impact of Cartesianism.

> We first arrive at science as research when and only when truth has been transformed into representation. What it is to be is for the first time defined as objectiveness of representing and truth is first defined as the certainty of representing, in the metaphysics of Descartes.[15]

Heidegger further holds that, if science as research is an essential component of modern age, then the metaphysical ground of such research has already been determined by Descartes when he seeks to give a metaphysical foundation of science by his *Cogito* principle. Heidegger thinks that, in that Cartesian interpretation of what is and through a specific comprehension of truth, it gives this modern age the basis upon which it is essentially founded.

> The essence of the modern age can be seen in the fact that man frees himself from the bonds of the Middle Ages in freeing himself to himself... what is decisive (here) is not that man (merely) frees himself to himself from previous obligations, but that the very essence of man itself changes, in that man becomes subject.[16]

It is true that in the history of philosophy the concept of subject is not a novel one; we can notice the occurrence of this concept even in the ancient Greek period. But to the Greeks the subject—*hypokeimenon*, that which lies before—meant the reality that confronted man by the power of its presence. It is Descartes who radically transformed the meaning of *hypokeimenon* and focused attention on man's own consciousness. Since then human self-consciousness has become the subject and 'the superiority of a *sub-jectum* (as a ground lying at the foundation) that is preeminent because it is in an essential respect unconditional arises out of the claim of man to a *fundamentum absolutum inconcussum veritatis* (self-supported, unshakable foundation of truth in the sense of certainty)'.[17]

Heidegger then hermeneutically discerns from this Cartesian metaphysical project the emancipation of modern man, and reveals that the freedom that he has chosen is self-determination and the ground of all his certitudes is to be found in his own self-awareness. This implies that modern man acquires the capacity to decide what is knowable for him, what is true, genuine

knowledge and what is truth or certainty. Without resorting to religion or tradition Descartes seeks the answers to these questions by his *Cogito* principle. His *ego cogito* becomes the seat of all certainty. *Vorstellen* or representation refers to present something out of oneself before oneself and to certify for the representation as such.[18] Through such representational activity of man the world, since then, is being conceived as a picture (*Bild*), and the traditional knower-known relation becomes reversed. The subject now 'assumes responsibility' for the presence of the object, and it is for this contribution that Heidegger regards Cartesianism as the final *Umkehrung*—reversal—in the Western knowledge situation.

In distinction from the Greek apprehending, modern representing implies something special; here to represent means 'to relate it to oneself'. Heidegger believes that in such representation of reality to himself man 'gets into the picture in precedence of what is'. He adds:

> . the fundamental event of the modern age is the conquest of the world as picture. The word 'picture' (*Bild*) now means the structured image (*Gebilde*) that is the creature of man's producing which represents and sets before. In such producing, man contends for the position in which he can be that particular being who gives the measure and draws up the guidelines for everything that is.[19]

From this he develops how modern science is the product of man and the modern man as scientist gradually gains 'mastery over that which is a whole'.

Heidegger then opines that the interweaving of these two events, i.e., that (*a*) man has been transformed into the subject and (*b*) that the world is being reduced to a picture, is very significant for the modern period, and throws new light both on the foundation of modern history and science and on the contribution of Descartes to posterity. Just as the role of man as subject assures the truth of the objects, similarly the transformation of the world into picture or representation adds a new dimension to the role of man in science and philosophy.

Recalling Protagoras' famous dictum 'man is the measure of all things', Heidegger elaborates how Cartesianism can be compared to it. After pressing the pertinent question, 'does this statement of Protagoras not sound as though Descartes were speaking?' he explains how the Cartesian concept of man as subject—as a thinking-positing being—and also of the nature of measuring has undergone metamorphosis.

> Man is now no longer *metron* in the sense of the restricting of his apprehending to the encircling sphere, particularized at any given time, of the unconcealment belonging to whatever presences toward which each man presences at any given time. As *subjectum* man is the *co-agitatio* of the *ego*. Man founds and confirms himself as the authoritative measure for all standards of measure with which whatever can be accounted as

certain—i.e., as true, i.e., as in being—is measured off and measured out (reckoned up). Freedom is new as the freedom of the *subjectum*.[20]

The freedom of the Cartesian man as subject, he holds, gets assurance through *co-agitatio* and *con-scientia*. The *con-scientia* of the ego as the *subjectum* of the *cogitatio* determines the being of whatever is. Since then we notice that man acquires a stable position, and the realm of human capability as a domain gains importance over measuring and executing in order to gain 'mastery over that which is as a whole'. Hence it is not at all surprising that since Descartes we experience the dawn of humanism. By humanism Heidegger refers here to moral-aesthetic anthropology, not to the analytic study of man by natural science. By humanism he means that philosophical interpretation of man which explains and evaluates whatever is in its entirety from the standpoint of man and in relation to man.

The discussion above makes it clear that the role of man as subject—as a thinking representing being—occupies the central position in the *Neuzeit*, and Heidegger admits the contribution and impact of the Cartesian heritage towards it. He remembers Descartes not only for the *Seinvergessenheit*, forgetfulness of Being, which he himself supplements, but also for the rediscovery of man and his free thinking that gradually leads to the unconcealment of Dasein.

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17. *Ibid.*, p. 148.
18. *Ibid.*, p. 134.
19. *Ibid.*
20. *Ibid.*, p. 151.

Consciousness—from behavioural neurologist's horizon

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Introduction

There are three grand roads to reach and enjoy the consciousness: the philosophy, the physics, and the biology. The philosophy achieved its goal thousands of years ago. The four Vedas are the ancientmost documentary for this. The modern physics, through vacuum physics and particle physics, has also objectively touched the 'consciousness'. In the material science today: 'There is no doubt about the existence of consciousness. There are doubts whether the matter exists!' The biology, in this regard, is lagging behind. It is limping very badly, and not keeping pace with the philosophy and physics. The reason is very fundamental. There is considerable lack of unifying synthesis from the vast ocean of factual data accumulated by analytical research in biology and neurosciences. This paper opens up the frontier of biology in the vast ocean of consciousness.

The Cortical Being—An Evolving Consciousness

The cortical being, evolved out of primordial protoplasmic mass after millions of years through millions of phases, may be visualized as an evolving biological consciousness. It has reached a stage when it can talk about, communicate and share consciousness. The organ of consciousness in human being is the cerebral cortex (Eccles 1980). Millions of cerebral cortical modules vibrating in different spatiotemporal pattern is responsible for infinite variety of consciousness in the human brain (Eccles 1980). The vibration of cerebral cortical modules occurs either through the brainstem or through the limbic system, or it originates within the cortex resulting in three basic forms of human consciousness, namely, Brainstem Consciousness (B.S.C.), Limbic System Consciousness (L.S.C.), and the Cortical Consciousness (C.C.).

Three Levels of Consciousness in Cortical Beings

There are three levels of consciousness in a cortical being: Brainstem Consciousness, Limbic System Consciousness and Cortical Consciousness.

Brainstem Consciousness (B.S.C.)

Neurology

Reverberation in the reticulo-thalamo-cortical and corticoreticular pathways (Inubushi 1978a, b), a balanced discharge of serotonergic pathway from raphe

nuclei and adrenargic pathway from locus cerulens (Phillis 1970; Krne 1974) are responsible for this Brainstem Consciousness by which one remains awake, alert and oriented.

Clinical Significance

This is the level of consciousness, commonly talked about in medical practice. This is the consciousness which is disturbed in concussion and contusion.

Personification

A security guard on duty may be visualized as B.S.C. personified. He is awake, alert and oriented.

LIMBIC SYSTEM CONSCIOUSNESS (L.S.C.)

Characteristic

It is a motivation-guided consciousness to seek pleasure and avoid the unpleasant. Basic motivations are thirst (mediated through osmoregulator centre), hunger (mediated through 'hunger', and 'satiety' centres of hypothalamus) and sex (mediated through preoptic hypothalamus, cingulate gyrus, paracentral lobules, and other centres). People develop special motivation for a particular music, taste, sight, odour or Meisner and Pacinian sensation in the sensitive parts of the body.

Limbic Nuclei

Amygdaloid and septal nuclei are the seat of its activities. Septal nuclei and lateral amygdalii are for pleasure, and the medial amygdalii are for aggression (and pain?). The lateral amygdalii are also responsible for friendship and fraternity. The septal nuclei and lateral amygdalii together constitute the 'Neurological Pleasure Traingle' (N.P.T.)

Consciousness personified

(1) Limbic system conscious persons are concerned about their own pleasure. In extreme stage, they can do anything for their own sensual gratification. Homicide, suicide and sadism are not impossible in their character. Simply, people call them selfish.
(2) According to the outflow from limbic nuclei, there are four basic types of character in human being. Limbicohypothalamic discharge makes one 'emotional'. Limbico-cortical discharge in association cortex marks one as 'intellectual'. Profound limbico-cortical discharge in decisive (pyramidal) cortex is characteristic of a 'mystic', and the people with strong limbicostrial (caudate nuclei) activity are seen in the 'worker'.
(3) This N.P.T., when stimulated from 'below' results in intense sensual pleasure. The same N.P.T., acted upon from 'above', is the cause of *ananda*.

CORTICAL CONSCIOUSNESS (C.C.)

Origin

The cerebral cortex with about 10,000 billions of neurons, organized in millions of cortical modules (each module consisting of about 2500 neurons), extensive neuropil and a huge synaptic density is the seat of its origin (Eccles 1980).

Manifestation

(1) Self-consciousness. Recognition of one's own image in a mirror is the objective sign of self-consciousness. It is human characteristic. A conscious baby becomes self-conscious by about eighteen months of age (Amster 1972). It has evolved since the day of early hominid, when they were making tools out of pebbles for protection of 'self' from the 'beast' (Eccles 1977).
(2) Creative imagination and activities (Eccles 1980).
(3) Integration and unification of consciousness. Distribution of consciousness in categorical and representational hemispheres are non-unitary (Sperry 1985). By various commisures in the forebrain, midbrain and hindbrain, and by some yet unknown mechanisms, unification and integration of various types of consciousness is achieved.

Difference with L.S.C.

L.S.C. is motivation guided. Pure cortical consciousness is without motive. 'Art is for art's sake.'

Consciousness personified

According to relative dominance and complimentation of three primary functional zone of cerebral cortex, there are three basic forms of cortical personalities:

(*a*) Self-conscious: The egoist and the egotist
(*b*) Creative: The genius
(*c*) Integrative: They are the men of the earth: sensitive, prompt responsive, proportionate and balanced.

Interrelationship amongst the Three Levels of Consciousness

These different types of consciousness are not watertight compartments. There are numerous associations, projections and commissural connections amongst them at various levels. Varying grades of combination are manifested in any particular individual. Let us analyse some of the facets of this complex interrelationship.

(*i*) By a dominating 'Limbic System Consciousness', 'Brainstem Consciousness' can be overcome. The self-stimulatory experiment with electrode implanted in the 'pleasure centre' of limbic system has shown that animal could be made totally immersed in that pleasure consciousness, being unaware of the surrounding and going sleepless (Brainstem Consciousness) for days without suffering from physical exhaustion of sleeplessness.

(*ii*) The 'Cortical Consciousness' abounding in human values can overcome the limbic system completely. Examples are seen amongst soldiers on the battlefield fighting for the motherland, spending sleepless nights without even the bare requirements of food and drink. The same is true for those who sacrifice their whole life for an 'ideal' or an 'ism'.

(*iii*) Those who do not pay heed to the 'Limbic System Consciousness' are motiveless people. Unless they are busy in manifesting their 'Cortical Consciousness', they are just like living rocks. In the absence of both 'Cortical Consciousness' and 'Limbic System Consciousness', a person becomes living luggage for his guardians.

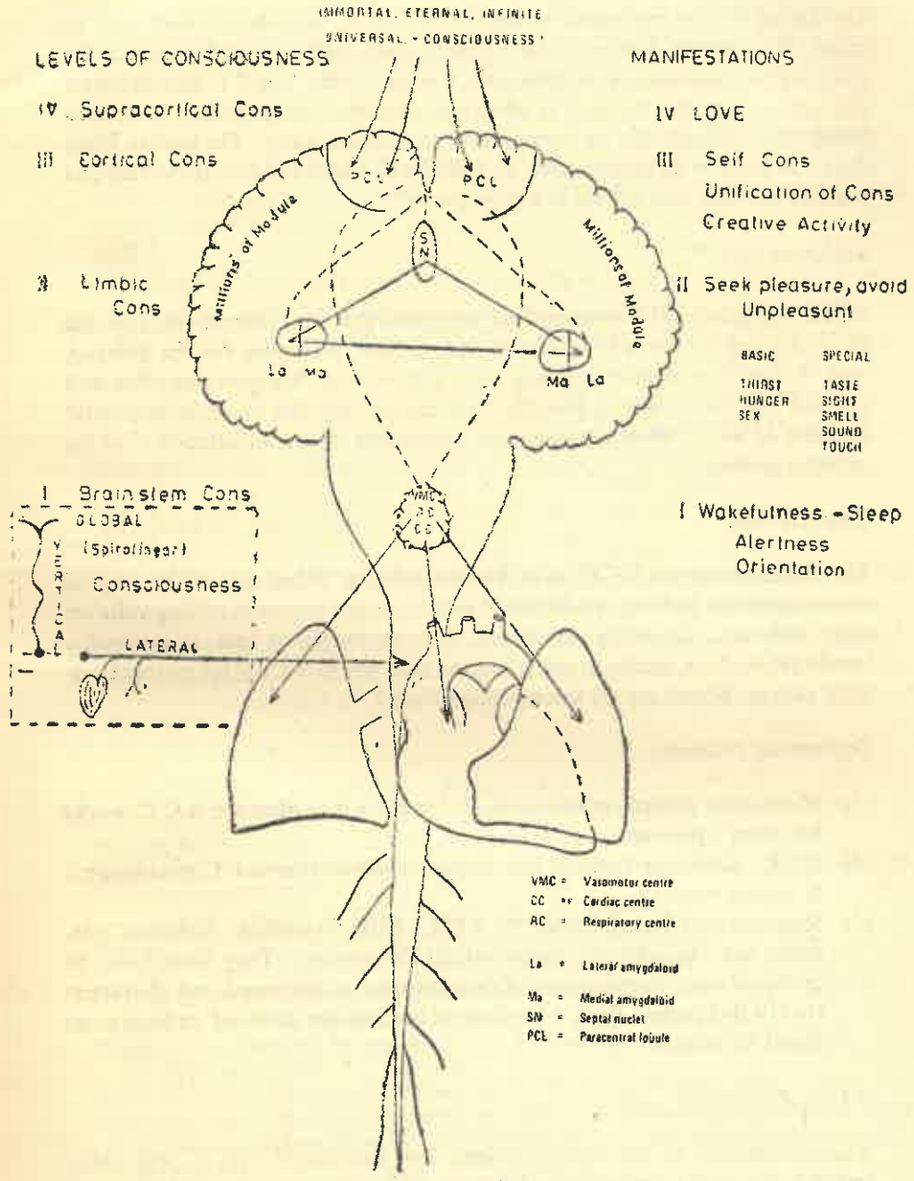
(*iv*) A few people learn the technique of manipulation of the limbic system through their 'will' (cortical activities) and become expert in changing the heart rate or respiration, overcoming thirst and hunger and can remain underground in sealed compartment. Ample examples are found amongst Indian *hath-yogis*.

(*v*) Even among talented people, who work mostly at the level of Cortical Consciousness with profound creative imagination and activities, lashes of compulsive sensual desire are not very uncommon, particularly where the limbic system is let free rein. They enjoy various types of food and drink, seek sexual gratification from innumerable women (or men) and sometimes go beyond all established norms.

(*vi*) Out of millions of genius only a few have been able to combine profound activities of the Cortical Consciousness with a reasonable restraint over the limbic system.

A New Dimension—Supracortical Consciousness

Attention, finally, shall be drawn to the existence of another level of consciousness which is called 'Cosmic Consciousness' by the physicists and 'Spiritual Consciousness' by all religious scriptures. For a neurophysiologist, it can be named Supracortical Consciousness (S.C.C.).



Consciousness—the Holistic View

Evolution

The day an animal expressed feelings for its fellow, identified its own 'self' in other, the dawn of Supracortical Consciousness had arrived. Caring for the offspring is characteristic of mammals. Caring for the 'dead' is seen amongst elephants. Care for the sick is observed amongst chimpanzees. In human being, this is responsible for formulation of 'human values'. The human being does not want to be singularized as individual. Instead, he wants to feel and practise oneness with others in every sphere.

Manifestation

When Supracortical Consciousness expresses through human neuraxis, the manifestation is love. The objective sign of love is sacrifice for the beloved. Aim of love is to achieve oneness with the beloved. Whatever sacrifice and love we observe in our day-to-day lives are, in fact, the result of successful expedite of S.C.C. through numerous obscurities of the infrastructure of the nervous system.

Characteristic

The characteristic of S.C.C. is its inexhaustibility. When any of the cortical consciousnesses becomes visibly inexhaustible, e.g. a person is writing volumes after volumes, unveiling mysteries after mysteries or one is expressing inexhaustible love, inexhaustible altruism, then one looks 'up' for an inexhaustible source. Where are all these coming from?

Differential Diagnosis

(1) Motivation guided consciousness is for one's own pleasure. S.C.C. works for other's pleasure.
(2) S.C.C. manifests through the highly evolved Cortical Consciousness. Is it motiveless?
(3) Supracortical Phenomenon vs. S.C.C. Thoughtreading, planchett, telepathy are examples of 'Supracortical Phenomena'. They should not be confused with 'Supracortical Consciousness' as proposed and characterized in this paper. Basic neurological mechanism involved in both cases could be similar.

S.C.C. Personified

Ascetic restraint of the limbic system, love-dominated ego, a personality beyond the polar opposites, elevating and magnetic attractability, inexhaustibility within cortical limits, are some of the traits of supracortical personality.

His/her intuitive creative activities do not stop in mere illumination but continues till there is revelation—a flood of stable light.

Ananda is the S.C.C. biologized at the level of limbic nuclei.

Transformation of the Cortical Being Into a Supracortical Being

Darwinian evolution with its struggle for existence, natural selection, chance and necessity, elevates consciousness to the biologically possible highest level of self-consciousness. Beyond that, one lands up in vacuum, a cosmic emptiness. There is no struggle, nor natural selection (cf. neo-Darwinian evolution). This phase is characterized by 'conscious critical rejection'. Aim is to outlight the vacuum. In the next phase, when the self-consciousness is unified with S.C.C., there is 'Lamarckian induction' by S.C.C. Three phases pieced together (there is a beautiful Sanskrit word for such a state *akhaṇḍa*, which has no synonyms in English) characterizes the scheme of transformation of the cortical being into supracortical being. This total process may be named as *akhaṇḍa* scheme of transformation.

Frontier of Research

The cerebral cortex is the domain of biologists. The physicist works in the plain of cosmic consciousness. This parallelism is to be replaced by interactionism to bring identity. The missing link of the cosmic consciousness and the highly evolved Cortical Consciousness are to be found out by the combined effort of neurophysiologists, physicists and the philosophers.

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Consciousness and the practice of science

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'Consciousness' for the purposes of this discussion refers to the fact that there are qualities that an individual is aware of associated with some of his experiences. Among these qualities are feelings of pain, sensations of colour, and images whose source is the individual's imagination. This is in contrast to experiences a person undergoes where such qualities are not present, e.g. when he is operated on under general anaesthesia. Philosophers have used various terms for these felt or experienced qualities; I shall call them 'qualia' and the experiences 'qualitative conscious experiences'.

There are other uses of the word consciousness, most of them having some connection to the use I am making of it. For example, when someone is having qualitative conscious experiences, he might also be conscious in another sense, i.e., not unconscious. We say that a person is conscious in this second sense, if he appears to be aware, to some degree of what is happening around him, for example, if he is reactive in certain ways. But the connections between this sense of consciousness and other senses are complex. Consider, for example, that a person in a coma is said to be unconscious, even though his limbs may react by moving when touched and even though he might be experiencing (i.e., be conscious of) pain or mental images without showing any sign of it. Some use the word consciousness in a broader sense than either of the two senses mentioned to refer to sensitivity, reactivity, or the ability of any entity to move.[1] The relation of this latter phenomenon to the fact that human beings (at least) have qualitative conscious experiences is presumably a matter suitable for scientific inquiry as well as conceptual analysis. How we label the various phenomena is not important as long as we are clear and consistent. But investigation of consciousness in any of its senses involves special problems, and many scientists have been chary of considering it in their professional capacity at all.

I am going to describe in broad terms the stance of contemporary science and philosophy[2] toward the phenomenon of consciousness and toward the possibility of accounting for it using scientific methods and categories. In many respects consciousness is the poor stepsister of science, including much of psychology. This is understandable in view of its seemingly ineffable characteristics, but I argue that a philosophically more sophisticated awareness of the problems surrounding the investigation of consciousness has some chance of leading to progress in understanding its relation to the rest of nature, while current attitudes on the whole have little chance.

One of the primary characteristics of qualitative conscious experience is

that only the individual having them is directly aware of their qualities. If I accidentally step on your toe, I can tell you are in pain if you cry out or wince, but I am not aware of the quality of the pain in the way you are. You feel the pain, I perceive your pain behaviour. This characteristic of conscious states—that in principle only one person is directly aware of their qualities—is sometimes called the 'privacy' and sometimes the 'subjectivity' of conscious experience. Such experiences are subjective in the sense that they are not observable by more than one person, i.e., they are not intersubjective. The phase of the moon can be observed by millions of people at once, the marks on an electron micrography by several people at the same time or many in series; these are intersubjectively observable phenomena, paradigmatically suited to scientific investigation. Science insists on objectivity, and an important part of this idea is that the details of scientific description be intersubjectively verifiable. The qualities of any given conscious experience can be described by only one observer. Therefore, they fail to satisfy one of the conditions for being proper objects of science.

There is a tendency to move from the fact that the qualities of conscious states are subjective in the sense of not being intersubjectively observable to the idea that such states are *merely* subjective, that is, not objective or real in the same robust way that, say, atoms and molecules are. This, in turn, is reinforced by the tendency to regard as real or at least as important only those entities and processes that figure in the existing theoretical apparatus for describing nature.

Now the reader may be inclined to protest that some branches of science—for instance, correlational neurophysiology and sensory psychology—do take the qualitative aspect of conscious experience into consideration, albeit indirectly. They do this by studying behaviour (in the broad sense that encompasses everything from physiological processes up to linguistic behaviour) that is correlated with the qualitative experiences reported by subjects in their experiments. But, by and large, such scientists are prone to a dismissive attitude towards the qualitative aspect of conscious experience. At present, of course, these researchers are dependent on the verbal reports of the people whose retinas or neurons (or whatever) are being stimulated. The ultimate aim, however, is to find enough out about the principles on which the nervous system operates that there is no further need to consult the qualitative experiences. The latter are, after all, subjective, but the brain states, which will some day be shown to be invariably correlated with, are intersubjectively observable, that is, objective phenomena. In short, it is considered desirable to frame theories that do not contain terms for conscious experiences *per se*.

The prominent philosophical account of the mind associated with such research is called the identity theory.[3] According to this view, qualitative conscious experiences (as well as other mental states) are simply states of the brain; there is nothing over and above patterns of neural firings, or states of

whatever physical structures turn out to be necessary for the having of conscious experience.

There are various objections to this view based on alleged properties of conscious states that are not possessed by brain states. Using the property of subjectivity as an example, the argument is that the state of a person's brain is in principle something that others can observe, while the conscious experiences correlated with those states of his brain are not. Therefore, being in a certain kind of conscious state is not the same as being in a certain kind of brain state, even if the two always occur at the same time. A common identity theorist response to arguments like this is that the view may sound strange due to certain presuppositions about mental states built into our language at its current stage of development; but, as the evidence for the theory grows, our way of speaking will change to accommodate the insights that science affords. This is a crude and quite incomplete characterization of 'the' identity theory.[4] However, it and the following discussion of two philosophical views that also complement directions of scientific research are intended merely to highlight the stance towards conscious states that I claim they share. The omitted subtleties do not invalidate this.

While the identity theory serves to rationalize the attitude that conscious states are an ultimately dispensable means towards the end of understanding the brain, the two other major philosophies of mind in the twentieth-century analytic tradition—behaviourism and functionalism—accord conscious states an even more minor role.

Behaviourism refers to a method of studying the psychology of human beings (and other animals) and to philosophical doctrines about the nature of the mental states.[5] Methodological behaviourists in psychology work on the assumption that only by confining themselves to the observation of overt behaviour can their results be scientific (for reasons like those sketched above). At its purest, the method involves observing behavioural reactions to stimuli in controlled experimental situations. Information about conscious states gained from introspective reports is considered to have no value for framing scientific theories of human behaviour. This implies that the existence of such states is irrelevant to describing and predicting human behaviour.

Philosophical behaviourists do not perform experiments; rather, they develop and defend the view that being in a mental state amounts to being disposed to behave in certain specified ways in specified circumstances. For example, to have a toothache is to be inclined to moan, to wince if the tooth in question is probed, to cup one's jaw in one's hand, and so on. To say that someone has a toothache is to assert quite a bit about his dispositions to behave, but not to say that he is experiencing a 'painful feeling. Note that the dispositions necessary for characterizing mental states might be very complicated and numerous. A behaviourist is not forced to view a human being as having a rigidly delimited range of possible behaviours. Still, a behaviourist

analysis of being in pain or imagining a yellow submarine seems to leave something important out, *viz.* the content or quality of the experience.[6]

Behaviourism has been largely supplanted by cognitivism in psychology and by functionalism in philosophy,[7] neither of which eschews reference to inner states in explanations of behaviour.[8] Strange as it may sound, this development has been closely linked to the discovery of formalisms for describing computational processes and the invention of machines that carry these processes out. Research in cognitive psychology is motivated to a great extent by the idea that the human mind processes information by utilizing some of the same general principles as a digital computer does. In particular, an analogy is discerned between the brain or nervous system of an organism and the hardware level of computer organization; and between the level of perception, reasoning, and action and the programmes that determine what its hardware will cause the computer to do.

Digital computers can do things like mathematical calculations and alphabetization that at one time only human beings could do, and which have been assumed to require thought and intelligence. They perform these tasks mechanically, because programmers have figured out procedures for doing them that are composed of very elementary steps. Quite complex computer behaviour can result from combinations of such simple steps performed by simple components. The human brain has parts (neurons) that have at least the capabilities of the elementary components of a computer, and which are in principle capable of being connected to one another in the same way as the elements of a universal computer. These considerations have given rise to the idea that the brain's performance may be due to its executing programmes, i.e., rule-based procedures that take the brain from one state to another. Neurophysiologists, psychologists, linguists and philosophers—'cognitive scientists'—are currently engaged in elaborating this conception at various levels of description of human cognition.

Functionalism is the philosophical movement associated with the idea that human cognition is like computation at one or more levels of resolution. For the most part, functionalists pursue the analogy at the level of the individual person; the level at which it seems appropriate to talk in terms of mental states like believing that sea water is salty, wanting some ice cream, or having a sharp pain. Psychological states, accordingly this view, are essentially defined by their role in the overall functional organization of a person's 'behavioural' repertoire, including his other psychological states. Thus, a rough functional analysis of being in pain might go: being in a state typically caused by certain inputs (e.g. ones that cause tissue damage) and typically issuing in certain outputs (e.g. withdrawal of the damaged part of the body from the putative cause of the damage).

Since, according to this view, such functional relations are *definitive* of psychological states, any entity regardless of its material composition (a human being, a computer, a Martian) would be in a given psychological state, if the state it were in had the functional relations characteristic of the psychological state in question. Anything that is in a state of having something analogous to tissue damage in a human being (perhaps, a robot having some metallic part melt) that causes that thing to do (or be disposed to do) something analogous to withdrawing from the cause of the damage is in a pain state. Where does this leave the qualitative experiences associated with some of our mental states? Qualia are not mentioned in functional analyses; the implication is that experiencing them is not an essential part of being in any mental state.

Note that such an analysis also makes the question of whether a *robot* has any qualitative conscious experience irrelevant to its being in a pain state. Some people think that the existence of consciousness in the sense of being aware of one's surroundings, having qualitative conscious experiences, and perhaps being self-aware is the result of the very complex organization of living matter in some organisms; while others think that sufficiently complex organization (interrelations of parts and rules governing the transitions between states) of any 'substrate' might result in conscious states of the entity so organized. (These alternatives obviously do not exhaust the possibilities.) The former group would doubt that a non-organic robot could be conscious, while the latter would deem it possible. Presumably, functionalists would be more comfortable in the pure complexity camp, since they assert that an entity's being in a mental state is independent of its material composition. In any case, the issue as to whether a robot is or could be conscious is not directly relevant to functionalism, given its view of the nature of mental states.

Functionalism also appears to imply that the existence of conscious states is not necessary for either thought or intelligent behaviour. Is the phenomenon of consciousness then a functionless artefact of evolution? It is often said that it is useful to feel pain, for example, because this motivates the sufferer to remove its cause; but functionalism has it that to be in pain is to be in a state connected by some rule to a state of attempting to remove the cause. It is not apparent that having a painful conscious experience is necessary for the rule-like movement from one state to another. Presumably, such corrective changes of state take place in our bodies all the time (e.g. when antigens are attacked by antibodies). Functionalism has nothing to say about why conscious experiences are associated with some changes of state and not others.[9]

The general attitude towards the scientific status of conscious states that I have been trying describe here in this paper cuts across personality and cultural differences between scientists to the extent that there is world-wide acceptance of the scientific method with its commitment to intersubjectively verifiable evidence. I do not claim to have represented the explicit beliefs or reasoning of any particular scientist or partisan of the scientific enterprise. And, surely, there are exceptions to the generalizations I have been making. The attitudes and presuppositions I have described are largely implicit in the way the majo-

rity of scientists choose the problems they will work on (which depends in part on what problems their predecessors have focused on, and so on).

So far I have shown that failure to take serious account of conscious states in scientific practice is in line with an insistence on intersubjective verifiability. However, it conflicts sharply with what I take the ultimate goal of science to be, namely, to explain all natural phenomena using an economical stock of scientific categories and laws. I have illustrated that one way of reconciling these two principles that seem to pull in opposite directions—intersubjective verifiability and comprehensiveness of theory—has been to downgrade the status of conscious states. Yes, this line of thinking goes; scientists aim ultimately to account for all natural phenomena; but conscious states are subjective, ephemeral, non-robust phenomena, if they are properly to be thought of as phenomena at all.

I suspect that some who have thought about this issue do not feel a conflict between the evident lack of scientific interest in conscious states and science's presumption to treat all natural phenomena. They are not inclined to doubt the full-fledged existence of conscious states; they tend to assume that the existence of such states is simply a fact about the world. At the same time, they implicitly accept the premise that science as presently practised will ultimately be able to explain all natural phenomena. How is it possible to hold both beliefs? It would be possible for both to be true, if states of consciousness are not *natural* phenomena. If conscious states are not a proper object of scientific investigation, as seems implicit in the actual practice of science, this leaves open the possibility that consciousness is a special feature of the world, including the possibility that it is special in any one of the ways that various religious traditions have claimed that it is.

However, inattention to consciousness on the part of science does not go any distance towards establishing it as a different kind of thing from the traditional objects of scientific inquiry, or as not subject to physical laws. If science does not even attempt to fit the phenomenon of consciousness into its overall conceptual scheme, i.e., if scientists do not try to frame and test hypotheses about the relation of consciousness to other processes in nature, the notion of consciousness as an extra-natural phenomenon is not thereby made any more probable. Such support for the idea that consciousness is in a category by itself would be provided only if science seriously tried to account for it and failed.

Now, it might be claimed that the work of some current psychology and neurophysiology can be viewed as an attempt to confirm the phypothesis that the qualitative aspects of conscious states need play not role in theories of human behaviour; that the attempt consists in the development of theories that account for perception, cognition, motivation, etc. without containing variables for conscious states. But if the qualities of conscious states end up being non-phenomena, i.e., if the theories give no clue that they will sometimes occur, the theories do not succeed in establishing their non-essentiality. In

other words, most current approaches are unsuited for producing genuinely reductive theories.

In fact, this construal of current theorizing in neurophysiology and psychology is something of an idealization. Many researchers do not consider it appropriate to frame explicit hypotheses at the current stage of development of their fields; rather they devote themselves to gathering sufficient data on which to base a theory. At the same time, they are gathering data with a certain general conception of what form any eventual theory will take. Of course, such an approach tends to reinforce the preconceptions that give it direction. Deemphasizing the phenomenon of conscious states is seen as a merit rather than as a defect, because the practitioner has viewed such states as secondary from the beginning.

I submit that a more defensible and fruitful approach would be to incorporate data about qualitative conscious states into the description of the phenomena to be accounted for; frame the most plausible hypotheses that appear to account for the data; and then (in the spirit of Popper) put them to the most strenuous and ingenious tests that one can think of in an attempt to disprove them.[10] If some hypothesis withstands such tests, it is to that extent confirmed, though naturally no amount of testing would render the hypothesis unalterable in the light of further developments in scientific research. It is impossible to foresee the consequences of disconfirmation of such hypotheses, since neither their detailed content nor the manner of their failure can be anticipated. However, Popper's contention is that in general disconfirmation leads rather naturally to new strategies and hypotheses.

Such an enterprise is easier imagined than undertaken. The fact remains that data about conscious experience are hard to access, and the reports of different individuals are hard to compare. The issue of how science should seek to deal with conscious states is further complicated by the circumstance that our data-gathering is itself mediated by conscious states. This is true whether we are aware of objects directly in perception or are only aware of their effects on our sense organs. This may seem like a consideration that complicates the issue needlessly; but actually it militates strongly in favour of seeking approaches to the study of consciousness that are not uncritically reductionistic from the very outset.

Most of us have come by our intuitions about the nature of consciousness from our own sensibility (the kinds of conscious states we have experienced), interpreted within the context of some religious, philosophical, or cultural traditions. Even those of us, not directly influenced by any particular philosophical or religious ideas about the nature of consciousness, are indirectly so influenced, because their broad conceptions become a part of the culture in which those religious or philosophical traditions are embedded. Thus, for example, a person who has grown up in Western Europe is likely to think of consciousness as primarily an individual and atomistic phenomenon; while someone who has grown up in India is likely to think of it as a continuous,

all-pervading feature of reality, whose individual manifestations are derivative. These background conceptions can colour introspective observation as well as communication about it.

The existence of such frameworks is not an entirely bad thing, if we are aware of them. Indeed, reflecting on these underlying concepts and making them explicit can be utilized in the service of a clearer and more comprehensive view of conscious experience. Conceptions about the nature of mental experience that we pick up with our language and cultural training are not mere fabrications, nor are they wholly metaphysical, regardless of the tradition in question. (Which is not to say that there are no inconsistencies within conceptions or that such conceptions are all compatible with one another.) They are based to some extent on actual features of mental experience that have become the focus of reflection and analysis. I see no reason why the insights of religious and philosophical traditions should not be taken into consideration in trying to understand the nature of consciousness. In fact, the observation and experience of generations is crystallized there; it is a source that should not be shunned merely on principle.

There is, of course, uncritical thinking and rigidity in all camps (including philosophical ones). Science has plenty to do besides trying to account for consciousness, and religion is content to rely on faith in support of its doctrines. But there are concepts in all of these belief systems that have the potential of broadening our options for thinking about and investigating the causes and effects of conscious states. It may be in the end that we cannot integrate the fact of consciousness fully into scientific theory. But if we make the effort to try a flexible and varied approach, drawing on diverse sources of ideas, we will at least have given it a creditable attempt. And if we become aware of our presuppositions and loosen up our thinking, then, if we fail to accommodate consciousness into our best scientific theory, we may be in a position to understand why it cannot be done.

Notes

1. This use might be linked to some view (e.g. a Spinozistic or a Vedic view) that the universe is imbued through and through with consciousness.
2. I write from the point of view of one trained in twentieth century Anglo-American philosophy, which particularly admires and to some extent emulates the methodology of science. My remarks may well not apply to other philosophical traditions.
3. The philosophical literature on the identity theory is very large. *Modern Materialism: Readings on the Mind-Body Identity*, edited by John O' Connor (New York, Harcourt, Brace, and World, 1969), contains an introduction and classic papers on the topic. For an example of a detailed working out of an identity theory view, see D.M. Armstrong, *A Materialist Theory of the Mind*, New York, Humanities Press, 1968.
4. There are many variants of the theory. In particular, I do not describe attempts by identity theoriests to show that the identification of brain states and conscious states is essentially like other scientific identifications, e.g., the identification of water with H_2O or the identification of heat with mean kinetic energy. The issues are subtle, involved, and important, but not within the scope of this paper.
5. Behaviourism is presently somewhat out of fashion both in psychology and philosophy. One of its most articulate and avid proponents in psychology is B.F. Skinner (see e.g. *About Behaviourism*, New York, Random House, 1974). A classic philosophical work that gives a behaviourist (dispositional) analysis of many mental concepts is Gilbert Ryle's *The Concept of Mind* issued in 1984 from Chicago University Press. The work was originally published in 1949.
6. Again, I concentrate on the sort of case that illustrates my point most clearly and forcefully. Ryle and other behaviourists have made substantial contributions to the philosophy of mind by showing that many mental states that we attribute to people—for instance, being intelligent or believing some proposition—do not entail the existence of occurrent conscious states. An attribution like 'She understands Gödel's theorem', if true, is true when the person in question is asleep, for example.
7. This is an area of explosive growth. A good textbook introduction to cognitive psychology is *Cognitive Processes* by L.E. Bourne (Jr.) *et al.*, published by Prentice-Hall in 1979. For clear summaries of various philosophical forms of functionalism and a collection of excellent papers, see *Readings in Philosophy of Psychology* (Vols. I and II) edited by Ned Block and issued from Harvard University Press in 1981.
8. Notice I did not say inner *conscious* states.
9. Functionalism in philosophy and especially cognitivism in psychology are labels that cover a diversity of rapidly developing views and foci of research. Perhaps there is actually work currently being done by psychologists aimed at filling the lacuna I perceive.
10. Popper is best known in the philosophy of science for the observation that, while scientific theories have no logical possibility of being fully confirmed, there is such a possibility of their being refuted or falsified (if counter-examples are observed, for instance), and for his view about the optimum scientific method, given this fact. His book on this topic is *The Logic of Scientific Discovery* published by Hutchinson in 1968.

The concrete and the abstract science: description versus explanation

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INTRODUCTION

Both historians and philosophers of science often make a distinction between 'description' and 'explanation'. Sometimes it is claimed that any science (natural or social) is concerned with both description and explanation, but in its two phases of development. Others maintain that the 'kernel' of science is either only description or only explanation, but not both. Since this issue is often directly linked with the nature and goal of science, it assumes great importance. And it is but natural that people will express themselves very strongly on such an important matter.

The objective of this paper is to look at this debate on the distinction between description and explanation and at the relationship between this distinction and the nature and goal of science, in the historical context and in terms of scientific practices, with the hope that history of science will provide important insights into meta-scientific debates. One celebrated philosopher of science has remarked that philosophy of science is 'a subject with a great past'.[1] With the decline of the 'Received View', philosophy of science in the sense of 'explication' or 'logical reconstruction' has lost its appeal. Consequently, the recent philosophers of science have turned away from a purely analytic and *a priori* approach. Instead, they look for understanding of science in the realities of scientific practices, past and present. Philipp Frank endorsed the ideal of historical philosophy of science and said, 'The history of science is the workshop of the philosophy of science.'[2] In a similar vein, Lakatos, taking cue from Kant's famous dictum, said, 'Philosophy of science without history of science is empty; history of science without philosophy of science is blind.'[3] Although the very idea of a 'historical philosophy of science' is plagued with difficulties, such as the nature of the evidential relationship between history and philosophy of science, historical relativism, the controversy between naturalistic and evolutionary epistemology, as can be seen in the works of E. McMullin, P.K. Machamer, D. Shapere, R. Giere, A. Shimony and many others, there is a general consensus that an ahistorical philosophy of science is 'totally inadequate'.[4]

In what follows I take the possibility of historical philosophy of science for granted, and use the insights derived from history of science to suggest a typology of science with a view to resolving the controversy between those who take either 'description' or 'explanation', but not both, as the sole objective of science.

The paper is divided into four parts. Section I identifies the context in which the contrast between the concrete and the abstract science arises; Section II views the contrast in the early development of astronomy; Section III looks at the contrast in the context of Aristotelian and Galilean approach to motion; and Section IV identifies the main features of the abstract science.

I

Distinction between Description and Explanation

Ida Freund in her book on history of chemistry[5] made a distinction between two kinds of activities undertaken by scientists:

(*a*) Descriptive or classifactory activities including prediction which correspond to finding answers to such questions as: 'What happens?', 'What is the case?', 'What are the observable facts?', 'What could happen?'
(*b*) Speculative, theoretical activity yielding ideas, concepts, theories, models, explanatory structures, which correspond to finding answers to such questions as: 'How or why do these things happen?' 'What are the grounds that determine their occurrence?'

For Freund the activities in response to question (*a*) can be designated as description and those in response to question (*b*) as explanation. However, she claims that science undertakes both these activities in its different phases of development, particularly chemistry did so.

K.L. Caneva in his historical study of electromagnetism[6] introduces a distinction between:

(*a*) The science of the concrete devoted to either systematizing data by specifying relationship between 'directly observables' or 'explaining' observable phenomena in terms of other observable phenomena but never stepping out of the domain of concrete or observables; and
(*b*) The abstract science which consists of making collectively evaluated universal knowledge claims and in which explanations are given in terms of deducing consequences from these universal knowledge claims.

Most sciences, according to Caneva, exhibit the features of science of the concrete in their early phases of development, but turn into abstract science in their later phases by lowering the degree of empiricism.

At this point it would be natural to ask the following questions: If an inquiry remains purely descriptive or concrete, should it be called a science? Is it inevitable that a descriptive or concrete science must turn into an abstract or explanatory science? What characterizes a science? A search for answers to these questions may usher us into a philosophical controversy, viz. the controversy regarding what science is all about.

Controversy Regarding What Science is All About

This controversy has given rise to two philosophical views:

(*i*) *The view that kernel of science is description, i.e. the descriptive or concrete science.* In philosophy of science empiricists, phenomenalists, positivists, instrumentalists, nominalists and anti-realists uphold a view of scientific theory which is exclusively based on the representation or description of the immediately observable and postulated elements that are 'Logical Constructions' out of the immediately given.

With the waning of the Aristotelian concept of demonstrative science consisting of necessary truths derived from certain first principles or hypotheses and the idea of teleology, the seventeenth-century science sought to base every claim about the world ultimately on sense experience and to justify the introduction of every admissible entity in terms of sense experience. The dissociation of science from teleology is evident in Galileo's refusal to investigate the cause of the acceleration of a freely falling body. The scholastic concepts of substance, efficient causes, and natural place in terms of which motion had been loosely described with a view to explaining why things moved were thus replaced by Galilean concepts of time, space, matter and force; concepts which were now first clearly defined and used mathematically to discover how things moved, and to measure the actual velocities and accelerations of moving bodies. Moreover, the ascendency of empiricism can be observed in Newton's famous Moon test, his criticism of Descartes' mechanical ideas not being firmly anchored in experience, and his discomfort with the introduction of the notion of 'attraction' and 'force' in his own mechanics. Such developments can be interpreted as indicative of a shift from attempts to found scientific knowledge on absolute certainty of deductions from first principles and to base it on the incorrigibility of sense experience.

The logical positivists replaced the early form of empiricism couched in psychological terms by putting forward a deductive dual language model of scientific theory, known as the 'Received View',[7] in which the theoretical language was thought to be parasitic upon observation language and could be eliminated from scientific discourse either by formalization, or by explicit definition in or reduction to observation language.

The theory independent observation language held the key to a view of science which aimed only at an accurate description of nature divested of all metaphysical posits. The independence of this language consisted of the fact that its terms derived their meaning solely on the basis of ostensive definition, reports or descriptions of sensations, or operational definitions.

In addition, many philosophers of science (e.g. empiricists and early positivists), attacking metaphysical concepts as idle and uneconomic, declared that scientific laws did not explain but only describe.[8] Mach regarded scientific laws as compendious rules or summaries of facts stating the connection of appearances with one another. In everyday language, the word 'description' refers to a single event or phenomenon. We 'describe' the fall of a specific stone at a specific time and space. If, however, we consider Galileo's law of freely falling bodies, which tells us that all bodies fall with an equal constant acceleration, we see that it 'describes' the fall of a great many bodies under different circumstances. This description of a class of phenomena is called by Mach a 'physical law'. Scientific theory, according to Mach, consits of 'the completest possible presentation of facts with least possible expenditure of thought'[9] by deducing empirical laws from a few general empirical principles:

> The communication of scientific knowledge always involves description, that is a mimetic reproduction of facts in thought the object of which is to replace and save the trouble of new experience. This is really all that natural laws are, knowing the value of the acceleration of gravity of Galileo's laws of descent, we possess simple and compendious directions for reproducing in thought all possible motions of falling bodies. A formula of this kind is a complete substitute for a full table of motions of descent, because by means of the formula the data of such a table can be easily constructed at a moments notice without the least burdening of the memory... More than this comprehensive and condensed report is not contained in a natural law of this sort.[10]

Metaphysical concepts (e.g. 'absolute space', 'time', 'atom', etc.), according to Mach, must be eliminated, because they do not achieve economy of representation.

Mach claims that in the investigation of nature, science attempts to find the best, simplest and most economic rules for the derivation of phenomena from one another. 'It is the object of science to replace, or *save*, experiences, by the reproduction and anticipation of facts in thought'. Elsewhere, Mach says:

> ...in the investigation of nature, we have to deal with knowledge of the connection of appearences with one another. What we represent to ourselves behind the appearences exists *only* in our understanding, and has for us only the value of a memoria technica or formula, whose form, because it is arbitrary and irrelevant, varies very easily with the standpoint of our culture.[11]

A direct consequence of this is the view called instrumentalism, i.e. a view which questions seriously whether science can explain anything, or do anything more than develop calculi intended to forecast phenomena; for after all science does not make any claims about reality other than finding mathematical relations between observables. This thesis, also called the predictivist thesis, can be traced in the Greek tradition of 'saving the appearances' and in the thoughts of Osiander in the fifteenth century. According to both, a hypothesis need not be true if it can provide a correct basis for calculation.

(*ii*) *The view that the kernel of science is explanation, i.e. abstract science.* Stephen Toulmin, in his *Foresight and Understanding*, has criticized the predictivist thesis. Prediction or forecasting, according to Toulmin, 'is a craft or technology, an application of science rather than the kernel of science itself'.[12]

Toulmin claims that the function of science is to build up systems of ideas about nature which have some legitimate claim to 'reality'. For Toulmin these systems of ideas provide explanatory techniques which not only must be consistent with data but also must be acceptable, for the time being at any rate, as 'absolute' and 'pleasing to the mind'.[13] Elsewhere, Toulmin says that, although scientific theories *inter alia* are used to predict, their main function is to provide explanations of recognized regularities.[14]

Popper takes theory/conjecture, and not observation, as the starting point of an evolutionary continuum of interacting problem-solving activity in man's quest for understanding himself and the universe. If man is to live in an unknown world and adjust himself to it, then, Popper believes, the most rational procedure for him would be to 'boldly propose' theories, try to show that they are erroneous, and to accept them tentatively till our critical efforts are unsuccessful. Hence, for Popper, the goal of science is to enable us to live in and adjust ourselves to an alien and hostile world as best as possible by 'explaining it...with the help of laws and explanatory theories'.[15] For Popper, too, conjecture (and refutation), not description, is the essence of science.

'The mechanization of the world picture',[16] which made the science of mechanics possible, implied, according to Locke, that ideas must be classified into two categories: some resembling the real qualities of things, i.e., the primary qualities of bulk, figure, texture and motion, and others that did not, *viz.* the secondary qualities such as feeling of warmth and sensation of colour. Moreover, from the success of Newton's science Locke wanted to derive the lesson that the scope of primary qualities must be extended so as to include 'latent configurations' or the imperceptible fine structures of the perceptible world. Hume challenged this assumption on the ground that it was inconsistent with epiricism, and treated it as pretension of science to reveal the hidden workings of nature. But, before the classical empiricists and their modern supporters could consolidate, the micro-world was opened up by the chemists, biologists and quantum mechanists.

These important scientific advances indicate that the task of science may not remain confined merely to discovering empirical regularities or explaining

these regularities in terms of higher-order empirical regularities, but might necessitate postulation of an entity or a realm of entities, properties, processes, relations that are not immediately observable and yet are assumed to be causally responsible for the empirical regularities requiring explanation. The role of abstract theorizing in achieving this task is very important as it enables us to understand nature by going beyond its observation, collation of observation and representation: '... a science based upon the correlation of sensations as its ultimate units of empirical information [is] no science at all, since explanation will be impossible.'[17]

In philosophy of science the conventionalists (such as Kant and Poincaré), those who view scientific theorizing as being relative to a conceptual perspective (or *Weltanschauung*),[18] those who subscribe to semantic approach,[19] the network model of theories,[20] or scientific realism, take explanation as the kernel of science and maintain: '...it consists in finding or imagining plausible generative mechanisms for the patterns amongst events, for the structures of things, for the generation, growth, decay, or extinction of things, for changes within persisting things'.[21]

Kantianism refuses to treat the general laws of nature as either reducible to immediately perceptible, or to logical constructions out of immediately given, by regarding them as the very conditions of our having any experience at all, or rather as conventions (so as not to subscribe to any psychological thesis about the nature and structure of mind). Duhem makes an important distinction between practical and theoretical facts.[22] He claims that science is not primarily concerned with 'raw data' or what we directly observe, which he calls the practical facts, as these facts themselves are susceptible to scientific analysis. Rather, what is significant for science is the interpretative formulation it provides for what is observed, what Duhem calls the theoretical facts. One important distinction between the practical and theoretical facts is that the latter 'do not stand on their own but are bound together in a network of laws which constitute the total mathematical representation of experience'.[23]

This shift from the 'Received View' of the logical positivists, who emphasize on the formal deductive two-tier structure of scientific theory, to building up hypothetical mechanisms for interpreting experience has been hailed by Harré[24] as the 'Copernican Revolution in the philosophy of science'. It consists, according to Harré:

> ...in bringing models into the central position as instruments of thought, and relegating deductively organized structures of propositions to a heuristic role only, and resurrecting the notion of the generation of one event or state of affairs by another. On this view theory construction becomes essentially the building up of ideas of hypothetical mechanisms.[25]

Thus, the Copernican Revolution in philosophy of science acknowledges that the heart of scientific activity lies in providing explanatory paradigms, conceptual perspectives or *Weltanschauung*, or constructing extra-linguistic model-structures based often on analogies and functioning as metaphors for further research with a view to generating increasingly more accurate insight into the real structures of nature that are thought to be causally responsible for the phenomena being explained. This abstract interpretative and metaphorical role to unravel 'hidden structure' by successfully and legitimately going beyond immediate experience and description of what happens is what constitutes the kernel and the essence of science. And this is the notion of abstract science.

II

The Concrete and the Abstract Science in the Antiquity and the Greek Period

The contrast between the concrete and the abstract science emerged out of the evolution of science in the antiquity and the Greek period. By tracing the evolution of science in the antiquity—particularly astronomy, cosmology, science of motion and biology— one would be able to gain insights into the conditions that led to this contrast in the ancient times. We will first discuss the contrast with specific reference to early developments in astronomy.

The Babylonian Computational Astronomy: An Example of the Concrete Science

The contributions in astronomy by the Egyptians (c. 2000–500 B.C.) and the Babylonians (c. 1800–150 B.C.) were mainly observational and computational in nature.[26]

The development of the 'mathematical' astronomy in these civilizations was dependent on the contrivance of many early astronomical instruments (e.g. gnomons, sundials, etc.) and computational techniques (e.g. number system, spherical geometry, etc.). This enabled the early astronomers to make meticulous observations and record them.

The cuneiform tablets found in the ruined cities of the Babylonian civilization provide evidence for the astronomical observations. Tablets containing astronomical texts fall into two categories. Texts of one category contain the rules, the arithmetical steps for computation, called 'procedure texts', while the other texts give tables of aphemerides (i.e., daily positions of the celestial bodies).

It must be noted here that the problems the Babylonian astronomers set out to solve shed light on the practical aims which Babylonian astronomy was expected to meet. Their command of arithmetical techniques enabled them to develop calendar and forecast many natural events (e.g. the first visibility of the new moon, lunar eclipses, floods, tides, etc.) with remarkable

accuracy. However, they achieved all these without having any idea about the physical nature of the systems of heavenly bodies.

The demands of trade and commerce, religious rites, and astrological prediction led the Babylonians to develop the calendar. For this achievement the Babylonian civilization is often known as 'calendar civilization'. The Babylonians devised a lunar calendar which defined a month as the interval between the successive sighting of the first crescent of the moon. Hence the basic problem underlying the Babylonian astronomy was to predict the visibility of the first crescent each month, for the beginning of the month was established on the basis of this phenomenon. It was a difficult problem for the following reasons:

(*a*) Predicting the invisibility of the moon just preceding the first visibility (i.e. the time of the conjunction of the sun and the moon) requires detailed knowledge of both solar and lunar velocities. The speeds of the sun and the moon across the sky are not constant. The sun comes back to the same star after a lapse of 365 days (roughly), having completed a great circle of 360°. Thus, the solar motion per day is close to 1° and close to 30° in one month. During the time the sun travels about 30°, the moon, however, travels not only 30°, but completes one additional whole rotation of 360°. Hence the moon covers in about thirty days 390°. This shows that the moon must cover about 13° per day. Hence the distance in question between the sun and the moon, the so-called 'elongation', increases about 12° per day. In fact, the daily elongation might vary between about 10° and 14° per day. This shows the problem involved in detailed knowledge of the variation of both solar and lunar velocities.

(*b*) The seasonal variation of the angles between the ecliptic and horizon also effects the visibility of the New Moon.

(*c*) The number of days from one New Moon to the next is not always the same. Sometimes it is twenty-nine days and other times it is thirty days. So it is difficult to work out beforehand the point of first visibility and whether any particular month is going to be twenty-nine or thirty days in length.

(*d*) There is the problem of keeping the lunar calendar in step with the annual cycle of seasons, i.e., the movement of the sun. A year made up of twelve lunar months is eleven days too short of a solar year, and a year made up of thirteen lunar months has nineteen days too many.

O. Neugebauer shows how the Babylonians came to regard this complicated periodic phenomenon (*viz.* the first visibility of the crescent) as the result of a series of independent periodic variations. One of the most important features of the lunar ephemerides is the use by the Babylonian astronomers of arithmetical series in which the terms uniformly increased to a maximum and then uniformly decreased to a minimum, and we can find by extrapolation the crucial maximal and minimal points they used.

As an example of the arithmetical procedure which the Babylonians used for making astronomical prediction and computation, one may consider the table showing the monthly conjunction of the sun and the moon which is a direct transcription of a cuneiform tablet referring to the year 133-132 B.C. (see the Appendix). Neugebauer says:

> ...one ingenious man conceived a new idea which rapidly led to a systematic method of long-range prediction. This idea is familiar to every modern scientist, it consists in considering a complicated periodic phenomenon as the result of a number of periodic effects, each of a character which is simpler than the actual phenomenon. The whole method probably originated in the theory of the moon, which we find at its highest perfection.[27]

This technique, according to Neugebauer, consisted of obtaining over-all averages for the main periods of astronomical phenomena. These averages then might be improved by occasional individual observations. At the same time, short-range predictions of phenomena could be made on the basis of a series of observations immediately preceding the event. Once the Babylonians had at their disposal extensive and accurate data, they analysed them, as men who prepare tide-table or economists working on 'time-series' do, to look for recurring cycles. Having detected a cycle, they observed deviations from the average and saw whether there was any cycle to be found there. Finding an average cycle in these deviations, they next examined the departures from this fresh average, and so on. By taking the process far enough, it was possible for the Babylonians to solve the practical problems they set out with; and to predict not only when the New Moon would be visible but also whether a particular opposition between the sun and moon would result in a lunar eclipse or when the retrogression of planets would take place.

In spite of this remarkable achievement in developing predictive techniques, the Babylonians did not bother to speculate on the cause/reason for these regularities. Once their practical problems were solved satisfactorily, they did not care to explain why these cyclical changes occurred or what agencies were responsible for them. They were content merely to know that these periodicities and the cyclical patterns existed without trying to explain why they did. In view of the nature of the problems the Babylonians were faced with, the emphasis in astronomy was more on using it as an instrument for recording and predicting astronomical events rather than to make sense of them or to speculate about the question: why these events took place as they did?

Is it necessary to answer this question? Is it necessary to 'explain' the regularities, the cyclical patterns? Obviously, the Babylonians did not see any point in doing anything other than recording the regularities and basing prediction on them. But, then, did they do science? Can 'scientific understanding' be equated only with observation of regularities and prediction? Of course, the Babylonians did not bother, but those concerned with meta-

scientific questions do bother. Will the criterion of demarcation repudiate Babylonian astronomy as science?

The Greek Astronomy : An Example of Abstract Science and the Problem of Real Motion

The empirical trend resurrected itself in the Ionian philosophers (c. 600-550 B.C.) who called themselves 'physiologoi', i.e., observers of nature. The Ionians, of course, divested astronomy of mythology and religion. They introduced naturalism and put forth cosmogonies (e.g. the one element, two elements theories of the origin of the universe).

The anti-empirical approach, however, was adopted, first, by the Phythegoreans (*fl.c.* 540 B.C.) who took abstract numbers, in place of physical processes, as the underlying principle of intelligibility, and emphasized a priori mathematical reasoning rather than observation. The Eleatic philosophy went a step further by making a direct attack on observational science and raising doubts about the evidences of senses. The Eleatics, such as Parmenides (*fl.c.* 500 B.C.) and Zeno (*fl.c.* 450 B.C.), relied exclusively on reason, and asserted the primacy of a new technique in invetigation, *viz.* the technique of logical argument, particularly indirect proof. This inaugurated the theoretical and speculative phase in Greek science.

The impact of this phase on astronomy consisted of interpreting the observational data collected earlier, removing anomalies in observation by speculating on various features of the cosmos and constructing theories to explain facts by going beyond them. They brought in all kinds of homely analogies: circular tubes full of fire with small holes through which fire was visible as stars; the earth swinging around a central fire; the music of the spheres constructed in accordance with harmony; the heavenly bodies embedded in crystalline spheres.

With this the distinction between empirical and rational abstract speculation was forced. The debate as to whether the reason or the senses was the true path to knowledge led to a reaction against observational Ionian science. The Pythagoreans and Plato came down strongly on the side of reason.

Many Greek philosophers (as the Greek scientists were called) related the visible changes in nature to the permanent principles underlying them (or 'logos'). They were convinced that nature functioned, not wilfully, but 'rationally', i.e., according to some principles. The philosophers' essential task was to get an intellectual grasp of the character of natural order, showing in this way why the events had to happen as they did. When the philosopher could back up his explanations by arguments, by recognizing the principles of things and showing how the gods were obliged to act as they did, then we could truthfully say that we understood.

The Greeks took certain principles, conceptions of natural order, as fundamental intelligible types, i.e., conceptions or principles which were 'sufficiently

clear, absolute and pleasing to the mind'. Any attempt to make sense, explain or understand the anomalies and problems in the apparent motion or the facts of observation (e.g. the retrograde motion of the planets) consisted of demonstrating that the happenings under investigation were special cases or instances of the principles or fundamental intelligible types, describing the 'real motion'.

It must be noted that initially the underlying principles or fundamental intelligible types were almost entirely qualitative. These qualitative astronomical theories did succeed in making sense of a whole range of observation by uniting them in terms of some pattern. But the astronomer's problem is by no means so simple. He must explain not merely the existence of an intermittent westward motion superimposed upon an overall eastward motion through the stars, but also the precise position that each planet occupies among the stars on different days, months and years. Apart from making nature intelligible, the astronomer's explanation must be quantitative, i.e., it must describe in lengthy tables, specifying in degrees and minutes of arc, the varying position of every planet. In other words, these underlying principles or fundamental intelligible types describing real motion should not be merely results of speculation but must lead to tangible, observable consequences.

In Greek thought, the assumptions of the following 'underlying principles' or 'fundamental intelligible types' can be found:

(*a*) *Numerical description of nature.* One important description of nature and all its regularities, according to one school of Greek thought, can be given in terms of arithmetical relationships. They believed that nature was commanded by numbers. There was a harmony in nature, a unity in her diversity. This harmony was expressible in a language: numbers were the language of nature.

(*b*) *Geometrical description of nature.* Since, the numerical description of nature ran into difficulties because of the discovery of non-commensurability (i.e., that there were relationships, such as the diagonal and the side of a square, which were inexpressible in terms of relationship between whole numbers or fractions) and working of nature in terms of visual ideas (e.g. pictures) was found to be inadequate, the Greeks held that explanation and description of nature could be given in terms of ideas of shape of geometrical figures. For example, some Greek thinkers supposed that the stars and planets moved in *perfect* geometrical figures, e.g. circles, because circles provided a completely satisfying explanation of the motions of *heavenly* bodies.

(*c*) *Mechanical description of nature* : Some Greek thinkers conceived the world to have a hidden structure or mechanism. Plato tells us that Anaxagoras claimed to be able to explain the workings of nature as a machine. Explanation of nature in mechanical terms seemed to be quite natural arising out of man's own experience. When he wanted to move an object he pulled or pushed it through the activity of his muscles and could imagine that Nature did effect her movements in a similar way.

The Platonic Traditon of 'Saving the Appearences': A Programme for Abstract Science

Plato had little to do with substantive science (except for his discussion on cosmogony in the *Timaeus*, but contributed much to the methodological and ontological issues in science and mathematics under the influence of the Pythagorean tradition. Based on discoveries of the links between, say, musical harmony and numerical relationship, Pythagoreans concluded that 'everything was number'. Plato's abstract science consisted of assigning a separate mode of being to mathematical entities and making them accessible only through rational thinking. Following are the three important features of Plato's abstract science.

First, Plato distinguished sharply between the world of things and the world of ideas. Objects and relationships in the material world were subject to imperfections, change, and decay and hence did not represent the ultimate truth. Hence the embodiment in matter impeded proper realization of mathematical (eg. geometrical) concepts. However, there was an ideal world in which there were absolute and unchanging truths. These truths were the proper concern of the philosopher. About the physical world we could only have opinions. The visible and sensuous world was just a vague, dim, and imperfect realization of the ideal world.

In the *Theaetetus*, a dialogue which tackles the problem of knowledge, Socrates (Plato's spokesman) helps Theaetetus, the great young mathematician, to discard the definition of knowledge as 'true opinion'. He examines the possible sources of knowledge and shows dissatisfaction with merely empirical knowledge of succession and coexistence of phenomena. This sort of knowledge, it is argued, must be transcended in such a way that the underlying rational order (i.e. logos) becomes manifest, or, to put it another way, the appearances/phenomena are invested with the ideal structures. This was the ideal of mathematization of science. Plato insisted that the reality and intelligibility of the physical world could be comprehended only through the mathematics of the ideal world, that empirical world was mathematically structured.

Since Plato, natural philosophers, who counted themselves as 'Platonists', believed in the underlying reationality/mathematizability of the universe and the importance of discovering it. And they drew sustenance from what they took to be Plato's similar conviction.

Secondly, Plato perfected the dialectical method as part of his rational mode of inquiry in which the argument was to be conducted by provisionally accepting a proposition, and then proceeding to show either that it led to a self-contradiction or a contradiction with something accepted as true, or that it did not. This gave grounds for rejecting or accepting it, purely on rational grounds. The mathematical equivalent of this form of argument is the *reductio ad absurdum* widely used by Greek mathematics (e.g. that $\sqrt{2}$ is irrational or that there are infinity of prime numbers).

Thirdly, Plato developed views regarding the objective of philosophical/scientific theories. He suggested 'the method of hypothesis', a form of postulational method, proposing theoretical unobservables out of which to construct a theoretical world to match the world that was observed. The abstract mathematical relations which fitted phenomena counted as explanations of why things were as they were. This programme, called 'saving the appearances/phenomena', amounted to superimposing mathematical relations on phenomena, e.g. the abstract *eidos* or form of uniform circular motion was related to the actual planetary movement to explain away their irregularity. Thus, it was taken to mean that (the abstract mathematical) form or ideas were instruments to make sense of observable phenomena.

Simplicius in his commentary on Aristotle's *De Caelo* attributes to Plato the tradition of 'saving the appearance', i.e., the tradition of instrumentalism. According to Simplicius, Plato takes for granted that the heavenly bodies move with a uniform and constant circular motion. He takes Plato to pose the following problem to the astronomers: 'What are the uniform and perfectly regular circular motions by the assumption of which we would save the appearences presented by the planets?'

Plato's influence was not only confined to astronomy but extended to other areas of Greek science as well. His notion of the 'method of hypothesis' or postulational method was one of the main foundations of scientific knowledge. The best expression of the postulational method could be found in Euclid. It became most effective in highly abstract subjects, such as pure mathematics, statics, and optics. At its purest, it was not experimental. Long chains of deduction followed from premises accepted as self-evident. For example, most of the problems investigated by Archimedes later required no actual experiment. In formulating the law of the balance and lever, Archimedes appealed not to experiment but to symmetry. However, in astronomy, the postulated hypotheses had to be tested by checking quantitative conclusions deduced from them against observation. All ancient and medieval systems of astronomy were based on Plato's dictum that the observed movements of the heavenly bodies must be resolved into uniform circular motions.

The justification for this can be found in the fact that the Greek methodologists made a distinction between astronomy and physics. According to them, astronomy had an 'instrumental' aim, while physics had an 'essentialist' goal.

III

The Contrast between the Concrete and the Abstract Science: The Aristotelian and the Galilean Approaches to the Science of Motion

The controversy between the Platonic and Aristotelian traditions with regard to the nature of scientific knowledge can be cited as perhaps one of the most

ancient controversies between the abstract and the concrete science. In contrast with the Platonic-Pythagorean tradition associated with numbers, idealized conditions, and abstraction, Aristotelianism always suggested an appeal to experience, to the real sense-data of the external world. Every experience is particularly important as a source of concepts in Aristotelian physics.

Aristotle's Physics: A Programme for Concrete Science

In contrast with 'the method of hypothesis', i.e., postulating theoretical unobservables, stands the strongly empirical method of Aristotle. Aristotle, though a student of Plato from whom he derived many ideas, had a quite different concept of the study of the real world. He was a physicist in the literal sense of the word. He believed in material things as the primary substance, and held that one must study the physical world to obtain truths from it. His hostility to hypothetical explanation derived also from his teleological (i.e., goal-oriented) understanding based on his intimate association with the biological aspect of nature. Aristotle's contributions to the investigations in local motion and biology are best examples of concrete science in that era.

Aristotle regarded scientific knowledge (*episteme*) of nature (*phusis*) as autonomous, and separated mathematics quite sharply from physics. The ground for his distinctions can be found in *Metaphysics* (Bk. VI, 1), *Physics* (Bk. II,2), *De Anima* and *De Caelo* (Bk. I).

In the *Metaphysics*, Aristotle identifies three theoretical sciences in the following way. Physics deals with those things which have a separate existence but are changeable and are the originative source of motion and rest. Mathematics deals with those things which have no separate existence, but are unchangeable. Theology, metaphysics or first philosophy deals with those things which have separate existence and are unchangeable.

Aristotle's Distinction between Physics and Mathematics

Aristotle's treatise under the name *Physics* has for its subject the 'natural' body in general. A 'natural' body was taken in both of its aspects of matter and form. It was supposed to contain an originative source of motion and rest, or an impulse to change as innately inherent in it. Aristotle regarded physics as the science of change in nature, including displacements of bodies, transformations of quality and quantity, generation and corruption. For Aristotle the task of physical principles and concepts was to represent reality in such a way that they not only rendered the general phenomenon of change intelligible by answering the question, how could there be change? but lent it meaning as well by answering the question, why was there change?

On the other hand, the attributes studied by the mathematician, according to Aristotle, were separable in thought but not in reality by abstracting them from sensible things. Thus, the distinction between physics and mathematics

lay in the fact that, while the former abstracted from the singularity of the changing concrete object, paying full attention to the qualitative richness of nature, the latter abstracted from qualitative accidents and change. To be specific, for Aristotle the physicist dealt with surfaces and volumes, lines and points as attributes of physical bodies, whereas the mathematician treated these attributes on their own right as attributes *qua* attributes. The distinction between snub-nose and hollow or concave is his favourite illustration of the distinction between the subject matter of physics and mathematics:

> But the abstractions of mathematics, as they are called, the mind thinks of as it might conceive the snub-nosed, *qua* snub-nosed it would not be conceived apart from flesh, whereas *qua* hollow, if anyone ever had actually so conceived it, he would have conceived it without the flesh in which the hollowness resides. So too when we think of mathematical objects we conceive them, though not in fact separate from matter, as though they were separate.[28]

Aristotle's Argument for the Inapplicability of Mathematics to Physics

According to Aristotle, the complexity and richness of nature create impedements and contaminate the realization of simple, pure and idealized mathematical ideas and relations.

In his *Metaphysics*,[29] Aristotle states that geometry does very well in the abstract as an idealization, but it does not work out when applied to sensible physical matters as it leaves out the qualitative details that constitute the physical singular as physical. Referring to Protogoras who confounded the geometers, Aristotle mentions the following example of the problem in geometric idealization: it is obvious in geometry that a sphere will touch a plane only at a single point. However, in real life a material sphere will be so heavy as to touch the plane at several points as the heaviness of the sphere would cause the plane to bend around it. Hence mathematics is inappropriate in studying nature. Secondly, Aristotle's concepts of matter presuppose the notion of change from the potential to the actual existence such that the very nature of matter forces it to exist potentially before coming into actual existence. In this process, forms which must necessarily be subject to changes play an important role. However, for Aristotle mathematical entities by virtue of their unchanging character obviously have no role to play in this process as the construction of physics, the science of change in nature, with the help of mathematical concepts, amounts to robbing change of its physical foundations, as he alleges in *On The Heavens* (*De Caelo*).[30]

Whereas the abstract ideal character of mathematics led Plato to believe that the observed world had an underlying ideal structure which provided the basis for its explanation and understanding, the same feature of mathematics prompted Aristotle to rule out the possibility of its grasping the complex

real world because of the inappropriateness and lack of fit between the ideal and the real.

However, in so far as mathematics deals with the quantitative characteristics embodied in matter or the real world and does not represent the postulated idealized underlying structures, Aristotle permits the use of mathematics. For Aristotle arithmetic signifies only a specific aspect or dimension of sensible objects, *viz.* numerosity, as he does not give numbers any independent ontological status. Similarly, Aristotle believes that in the observation of nature knowledge of geometry is necessary for a proper understanding of such natural phenomena as an eclipse, a rainbow, etc.[31] The reason for this is that the explanation of the occurrence of such natural phenomena would be given in terms of certain physico-mathematical properties (e.g. a certain spatial configuration between the sun, the moon, the spherical raindrops and observer, the rectilinear path of the light ray, etc.) that exhibit the closeness or fit between nature and geometrical idealization. Such closeness or fit was thought to be the basis for the so-called 'mixed sciences', such as astronomy, optics, mechanics and harmonics, in which Aristotle took the use of mathematics for granted.

In spite of the endorsement of the 'mixed sciences' in the Middle Ages and the Renaissance by the followers of Aristotle (e.g. Robert Grosseteste, Albert the Great and Thomas Aquinas), the Aristotelian tradition maintained a distinction between the two forms of intelligibility: one proper to the physicist and the other to the mathematician. Thus, Aristotle's account of *phusis* cannot reconcile the empirical and concrete analysis of physical phenomena with its abstract ideational reconstruction based on mathematical intelligibility. The best example of this can be found in the Aristotelian account of local motion.

The Aristotelian Account of Local Motion

Aristotle's emphasis on the empirical and concrete analysis of physical phenomena led him to formulate an account of motion which paid attention to (*i*) external agency acting on the body in motion, (*ii*) resistance of the medium through which the body moves; and (*iii*) the weight of the body.

A typical example of observed motion would show that the factors identified by Aristotle are relevant. Consequently, Aristotle claims that a given body can be displaced in a set time through a distance directly proportional to the effort available; that the amount of effort by which a body can be displaced will vary in inverse proportion to the size/weight of the body to be moved; and that the distance travelled in a given time will vary inversely as the strength of the resistance offered to motion.

Aristotle's treatment of motion is thus utterly consistent with observation as well as his cosmology: the doctrine of natural place, the two sphere cosmos, the doctrine of contraries, etc. He identifies the external force with the 'motive power' and ultimately with certain animistic or anthropomorphic assumptions in an otherwise mechanical system.

Because of his empirical bent, Aristotle refuses to entertain situations in which all resisting agencies would be effectively or completely removed and motion would be instantaneous since this would have appeared to him as over-abstract.

The Geometrization of Motion: Galileo's Abstract Science of Motion

The central question in the strife between Aristotelian and Platonic-Pythagorean traditions is the role of abstraction and idealization, and its relation to the role of sense perception and practical experience. Galileo's thought on this issue has led many scholars (e.g. Koyre, Burtt, Drake, Settle) to debate his affiliation either to Platonism or to empiricism and experimental science.

Galileo, carrying forward the work of the medieval thinkers, constructed a kinematical theory in his *Two New Sciences* which bears a relation similar to that of Euclidean geometry to works of earlier Greek geometers. He realized that mechanics was not a mere systematic observation, but involved (*a*) observation that could yield geometrically and quantitatively determinable data, and (*b*) methods of interpreting sense experience with the aid of geometry.

The fundamental assumption which Galileo made here was that the 'primary qualities' which characterized body corresponded to the notions of a particular kind of geometry; that a specific geometry provided an actual conceptual schema or model. With revisions of our concepts of space, time and geometry, this assumption seems no longer valid. However, the important role he thereby assigned to model and abstraction rightly earned him the title the 'father of modern science'.

IV

Abstract Science: Its Main Features

Science, or its earliest manifestation philosophy, was the result of man's efforts either to adjust himself in an alien, inhospitable world or to satiate his curiosity. In its earliest form, science/philosophy consisted of relating things which one did not understand (e.g. eclipse, flood, thunder, lighting, etc.) with things which were familiar (e.g. feelings and emotions of human beings) or things one understood. Nature was conceived by analogy to what human beings had experience of.

As science progressed, its objective changed into relating the anomalous in observation to some accepted principles. For example, the task of early astronomy was complete only when all the celestial motions were displayed as explicable in terms of the following principle: in nature all bodies beyond

lunar region moved uniformly and regularly in a circle. Astronomers from the time of Plato and Aristotle down to Copernicus adhered to this principle.

In due course, the task of science consisted of relating the 'phenomena' (i.e., departure from the regular order of things) to paradigms (i.e., an 'exemplar' or 'ideals of natural order'). A community of scientists proposes or assumes that certain behaviour patterns are natural and expected; the expected does not require explanation—only the unexpected does. The job of a scientific theory, then, is to specify these expected patterns of behaviour and to explain deviations from them. All behaviour within a given domain, then, is to be accounted for either by its conformity to expectations or by explaining its deviations from expectations. However, this presupposes that a community of scientists agree upon certain natural course of events, paradigms or 'ideals of natural order', e.g. the law of inertia or the principle of rectilinear propagation of light, etc.

The main function of these paradigms or ideals of natural order is to provide fresh ways of looking at phenomena by providing a 'mode of representation for those phenomena'.[32] Being methods of representation, they are neither true nor false; rather, they are more or less 'fruitful'.[33] A scientific theory embodies certain ideals of natural order which are presuppositions about phenomenal behaviour. These presuppositions constitute an intellectual frame of thought which determines the questions the scientist asks and the assumptions which underlie theorizing. They even determine or influence what are counted as 'facts'. If the discovered scope of the theory is such that the theory can explain a large variety of phenomena and answer a substantial proportion of the questions about the phenomena which are counted as important, then the theory is fruitful for the time being.

It is this conception of theory that differentiates abstract science from the science of the concrete. Moreover, the abstract science reaches beyond empirical co-occurrence to postulate a representation or structure for the phenomena under investigation, one which accounts for the co-occurrence and potentially for other aspects of the phenomena not yet observed. Further, scientific theory, according to abstract science, is not an economic presentation of accumulated propositions claimed as 'known'. Rather, it goes beyond mere logical organization of given facts in reinterpreting our experience in terms of fresh concepts, methods of representation, explanatory procedures, paradigms or ideals of natural order. A theory is intended not as a description of what one already knows but as a hypothesis: something that goes beyond the evidence by introducing a postulated physical structure that could provide an inferential or causal account of the data to be explained.

It must be emphasized here that the ideal of natural order, representation, postulated structure may neither be directly observable nor more 'familiar' than the data to be explained. This is the reason why it is called 'model', and every theory has a model associated with it. Because of this associated model,

a theory is able to explain phenomena rather than merely being a description or summary of them.

There are several sense of 'model' that one can dismiss as of little interest to see this relationship between the ideal of natural order and phenomena. First, model in the sense of scale model or replica or ideal to be imitated are not relevant here.

A model, as defined by mathematical logicians or model theorists, is a possible realization or interpretation in which all valid sentences of a theory are satisfied. The 'possible realization', in turn, is a set-theoretical structure of some sort. Though this has some affinities with the natural scientist's use of the word 'model', the differences between the two uses are at least as important as the similarities.

In mathematical logic, no distinction is made between a calculus and a theory. This has often given rise to misconceptions, since a theory is frequently identified with an uninterpreted calculus. An interpretation, as understood by a mathematical logician, amounts to applying the calculus directly to a specified domain or a mathematical structure described in set-theoretic terms.

A scientific theory, however, differs from the logician's notion in the following respects:

(*i*) As opposed to the calculus, a scientific theory contains symbols/terms with complete or partial interpretation often based on analogy. The logician's notion of interpretation constitutes a marked difference between a calculus and a scientific theory; and

(*ii*) The logician's calculus involves no reference to time, whereas reference to time is instrinsic in scientific theories and concepts.

Hence the notion of model in science must take note of and scrutinize the actual epistemological practices inherent in scientific activity. The definition must be offered in a conceptual system which will articulate as closely as possible the way scientists view the relationship between theory and model or even between model and empirical law.

Falling back on our notion of abstract science, a model can be identified with the postulated structure, the ideals of natural order, whereas the theory is the set of statements in terms of which this structure or ideal is provisionally described. The theory is, therefore, a linguistic and mathematical entity, whereas the model is not (as it describes the ways of looking at phenomena). The theory is derived from the model and not the other way round. Unlike the mathematical logician's sense the model is not simply an interpretation of the theory, but is a structure of ideal/mathematical elements which is capable of entering into an appropriate semantical use to represent or elucidate a significant structure of phenomena.

The distinction between the science of the concrete and abstract appears to be important for two reasons:

(*i*) Under the influence of crude empiricism, and positivism, the behavioural approach reduced certain areas in social science into the science of the concrete.[34] The dissatisfaction with 'hyperfactualism' and 'barefoot empiricism' led several political scientists, like Easton, to make a commitment to abstract theory-construction activity.

(*ii*) The importance of the role of the model of man in social sciences, akin to the role models play in natural sciences, have not been fully appreciated. A plea for a debate on this has been repeatedly made in the Herbert Spencer Lectures compiled in the book *Scientific Models and Man.*[35]

In conclusion, a historically sensitive analysis of the growth of scientific knowledge exhibits that too restrictive a use of the word 'science' would leave out a wide range of activities that legitimately could come under it as their practitioners pursue them with various objectives, practical or otherwise. However, within that we can make a broad typological distinction between what may be called concrete or abstract science.

Notes

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18. Frederick Suppe, *The Structure of Scientific Theories*, (2nd edn), Urbana, University of Illinois Press, 1977, pp. 125-221 and pp. 633-49.
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22. Pierre Duhem, *The Aim and Structure of Physical Theory* P.P. Wiener (trans), Princeton, Princeton University Press, 1954, p. 133.
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APPENDIX: (*a*) The Transcription of a Babylonian Ephemeris

Year	Successive months of the year	Monthly progress of the Sun across the Zodiac	Anticipated position in the Zodiac of the conjunction	Sign of the Zodiac
2, 59	I	28, 37, 57, 58	20, 46, 16, 14	Taurus
[Selencid Era,	II	28, 19, 57, 58	19, 6, 14, 12	Gemini
i.e. 2 × 60+	III	28, 19, 21, 22	17, 25, 35, 34	Cancer
59 = 179	IV	28, 37, 21, 22	16, 2, 56, 56	Leo
after 312	V	28, 55, 21, 22	14, 58, 18, 18	Virgo
B.C. or	VI	29, 13, 21, 22	14, 11, 39, 40	Libra
312—179	VII	29, 31, 21, 22	13, 43, 1, 2	Scorpio
= 133—2	VIII	29, 49, 21, 22	13, 32, 22, 24	Sagittarius
B.C.]	IX	29, 56, 36, 38	13, 28, 59, 2	Capricorn
	X	29, 38, 36, 38	13, 7, 35, 40	Aquarius
	XI	29, 20, 36, 38	12, 28, 12, 18	Pisces
	XII	29, 2, 36, 38	11, 30, 48, 56	Aries

(*b*) The rule for computing the position, taking the example of month II to month III and the transition from Gemini to Cancer

From the given position in Gemini	19, 6, 14, 12
Add the monthly progress of the Sun	+ 28, 19, 21, 22
	47°, 25, 35, 34
Subtract 30°	− 30°
The position of conjunction in Cancer:	17, 25, 35, 34

(*c*) The table indicates a cycle based on arithmetical progression, i.e. increase and decrease with constant fixed difference between two limits (between 28° to 30°):

Months	Decrease	Increase
I—II	18′	
III—VIII		18′
IX—XII	18′	

Descriptions and group reference*

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Recent work on definite descriptions, inspired primarily by Strawson and Donnellan, has provided many insights into the complexity and diversity of this linguistic phenomenon. These insights, in turn, have raised growing doubts about the availability of Russell's theory of descriptions for a large number of cases without supplementing, as yet, Russell's theory with some alternative theory. What is suggested instead are distinctions, classifications, taxonomies and the like. A persistent problem, then, is to understand 'why the same construction with a definite article is used for a wide variety of cases'.[1]

In this paper I shall suggest some steps towards a unified account of a wide variety of uses of English definite descriptions without imposing any arbitrary restrictions on the phenomenal domain.[2] Details of this account apart, I shall try to develop two general claims. First, the critiques of Russell's theory of descriptions developed by Strawson and Donnellan are in the right direction, but neither of them go far enough. The limitations with their critiques, in my view, are a result of their continued, if only partial, adherence to Russell's theory. Russell's theory, I shall argue, has *nothing at all* to do with the uses of the English definite article.[3] Russell's theory probably applies to the idiom of "exactly one", but I would not go into that. Secondly, a complete dissociation from Russell's theory brings into sharp focus a fundamental *communicative* function of the English definite article, a function which was only dimly appreciated before.[4] The definite article, I shall argue, helps establish, in a fairly regular way, a guarantee of communication between a speaker and an audience such that they can proceed to *further* exchange of information.

My methodology would be as follows. First, I shall try to bring out, as clearly as I can, just why Russell's theory cannot be applied to certain cases either ignored or unnoticed by Russell (Section I). This stage of the discussion, then, should generate at least a loose dichotomy of the uses of definite descriptions—those that do not obey Russell's theory (Section II) and those that supposedly do (Section III). Secondly, in a gradual reversal of motivation, I shall dilute the dichotomy by placing the supposedly dichotomous phenomena on a (intuitive) linear scale (Section IV). Next, I shall furnish some preliminary account of how such a linear scale is 'continuously' generated by certain underlying factors governing uses of definite descriptions (Section V). Finally, I shall touch on some problems of misdescriptions (Section VI) and vacuous descriptions (Section VII) which led to the philosophical discussions of definite descriptions in the first place.

According to Russell's theory of descriptions, an English sentence of the form "The *G* is *F*"[5] is to be analysed, at least, as "One and only one thing *G*s and that thing also *F*s". Following Kripke,[6] we may think of this theory as a theory to the effect that English is a 'Weak Russell Language'. The theory does not deny that "The *G*" is a 'primitive designator'. The only conditions that the theory imposes on sentences of the form "The *G* is *F*" are: (*i*) the referent[7] of "The *G*" is that unique object which satisfies the description "*G*"; and (*ii*) the sentence is true if the predicate "*F*" is true of the referent of "The *G*", the sentence is false otherwise. Russell's original theory may be construed as a theory to the effect that English is a 'Strong Russell Language' where "The *G*" is no longer a 'primitive designator' but an 'incomplete symbol'. Strawson and Kaplan,[8] among others, have raised pursuasive objections against the strong theory from various directions. It is generally believed that such objections leave the weak theory pretty well untouched except, of course, the vacuous description problem. If "The *G*" is a 'primitive designator' then, if "The *G*" is vacuous, both "The *G* is *F*" and "The *G* is not *F*", according to the Weak Theory, are false. Since Russell's scope distinctions are not available for the Weak Theory, this would lead to a violation of the law of excluded middle. My primary concern in this paper, however, is with condition (*i*) in the statement of Weak Theory; in particular, I am concerned with the notion of 'an object uniquely satisfying the description *G*'. This notion, surely, is involved in any Russellian Theory. If this notion is found to be inadequate, there is no need for moving on to the Strong Theory. The need, then, would be for an alternative non-Russellian theory which can handle the vacuous description problem.[9] My discussion, therefore, will be confined to the Weak Theory.[10]

A first problem with Russell's theory is that it applies, if at all, only to phrases of the form "The *G*" in the singular. The theory, thus, ignores phrases like "The brothers of ...", "The numbers preceding ...". If we follow the 'quantificational' interpretation, then perhaps it is possible to generalize Russell's interpretation in various ways to include phrases in the plural. According to Chomsky,[11] for example, we can think of an use of the definite article "The" as signifying a universal quantification with existential import and the semantics of such a quantification may be captured in standard set theory. I cannot discuss here whether, given our interest in the Weak Theory, a Chomskian solution to this plural description problem meshes with putative solutions to the further problems raised below. If my ultimate account of definite descriptions across the board is correct, we do not *need* a solution along Chomskian lines.

A second, more fundamental, problem has been raised by Keith Donnellan.[12] According to Donnellan, a definite description, say, "The President", may be used attributively to denote whoever happens to be the President as

in "The President has lived in the White House since 1800"; or, the same phrase may be used referentially to pick out (or to enable one's audience to pick out) a particular President as in "The President has been married since 1945".[13] Donnellan has shown further that not only the same phrase but even the same sentence may, on different occasions, be used differently ("The murderer of Smith is insane"). Moreover, in a referential use, an individual may be successfully picked out by the audience, even if the individual does not (fully?) fit the description. Donnellan complains that Russell's theory explains, at most, the attributive uses of definite descriptions, the uses based on general, non-contextual knowledge; the uses in which the only way of successful reference/denotation is via a (perfect?) fit with the description.

Saul Kripke,[14] among others, has suggested, following Grice, a way of saving Russell's theory from Donnellan's complaint. Russell's theory, for Kripke, concerns the 'semantic referent' of "The *G*"—the object that uniquely satisfies "*G*". When *using* "The *G*" in a declarative sentence, the user/speaker has a referent 'in mind' which may or may not match the semantic referent. Paradigmatic attributive uses are those where the speaker's referent[15] and the 'semantic referent' are identical. Paradigmatic referential uses are those where speaker's referent is (almost) totally divorced from the semantic referent. If the audience has access, somehow, to the speaker's referent, the reference can still be successful despite misdescription. Donnellan's distinction reflects vagaries of speech-act, not ambiguities of language, the Weak Russell Language, in particular.[16]

How successful is this line of reasoning? Suppose, we grant all of the following: (*i*) That we clearly understand the notion of a speaker's having a referent 'in mind'; (*ii*) That speaker's reference is not involved in semantic reference; (*iii*) That all cases inviting Donnellan's distinction can be explained in terms of Kripke's distinction; (*iv*) That Kripke's distinction is available *anyhow* in languages without definite descriptions or in languages containing explicit devices for handling Donnellan's distinctions.

Even then, how does a particular classification scheme, Kripke's, save Russell's theory when this theory is threatened by the very notion of classification? Given that Russell's theory is not initially framed with the semantic/pragmatic (or, for that matter, the language/speech-act) distinctions in the relevant way (these distinctions presumably do not arise in the use of an artificial language, *viz.* the Weak Russell Language), these distinctions can now save Russell's theory only if there is an underlying theory, compatible with Russell's, that generates these distinctions *parametrically*, i.e., the theory gives a systematic account of how the elements of a distinction change 'values' under varying circumstances and, so changing, map onto Donnellan's distinction on some points. In particular, we need a systematic account of how the parameters of speaker's reference and semantic reference *interact*. I shall suggest *one* such account, but I am not at all sure that this ensuing account is compatible with Russell's.

In any case, Kripke agrees[17] that certain constructions involving the definite article—'The man", "The table"—so-called 'imperfect definite descriptions',[18] provide at least a 'tentative stab' about Russell. So a third problem with Russell's theory concerns definite descriptions 'where uniquely specifying conditions are not contained in the description itself'. Kripke hints (but does not develop the suggestion) that the problem with this class of definite descriptions may not be solved in a Russellian way by 'regarding (them) as elliptical with uniquely specified conditions added'; that, maybe, a correct understanding of such phrases has something to do with Donnellan's referential use.

If so, then there is at least one variety of case with which Russell's theory may be directly challenged without recourse to misdescriptions; hence, possibly, without depending too much on the notion of speaker's reference. The challenge is direct, simply because, if Kripke's hint is correct, the semantic reference of "The man" is not Russellian. Kripke[19] hints that "The man" is more like a rigid designator "That table" than like the non-rigid designator "The teacher of Plato".[20] Apart from the uneasy suggestion that two different constructions in a language—"The table" and "That table"—have identical semantics,[21] the rigid distinction between rigid and non-rigid designators seems to forestall any attempt at placing Russellian and non-Russellian descriptions on the same continuum. I need, therefore, a more flexible distinction at this stage. I shall try to develop, in the next section, Kripke's general point in my own way.

Before I do so, let me list some other varieties of cases where Russell's theory does not strictly apply. Constructions involving mass terms ("The sand is hot") and species terms ("The whale is a mammal") do not quite mesh with the condition of 'one and only one *thing*'. Again, I expect that the ensuing account would be general enough to cover such cases. In general, I do not think that uses of the definite article have much to do with *numbers* or *quantities* as the Russellian picture seems to suggest. Thus, I don't even think that an use of "The G" 'implies', in Strawson's sense of 'implies', that one and only one thing *G*s.

Further, I expect the ensuing account to cover, more directly, uses of "The" with a stress: "I bought myself *the* coat yesterday." They can be used referentially, in the subject position. "*The* man finally arrived in my life"; or, attributively, "*The* man will never arrive in my life". Still more puzzling are the phrases which, to use Strawson's vivid phrase, 'grow capital letters', lose the stress and turn into proper names—"The White House". "The", in such cases, does seem to carry a Russellian sense of 'uniqueness' *all by itself*. Strawson[22] accounts for such uses in the following way: 'Such phrases are found in print or in writing when one member of some class of events or things is of quite outstanding interest in a certain society.' I shall try to generalize this idea for all uses of "The" across the board, whether spoken or written.

I shall leave it to the readers to judge whether all these promises are, indeed, delivered at the end.

II

In the second paragraph of his 'On Denoting',[23] Russell explains his interest in the denoting phrases. Denoting phrases allow us to think 'about many things with which we have no acquaintance'. Thus, although we have no acquaintance with the centre of mass of the solar system at the first instant of the twentieth century (Russell's example), we know that the phrase "The centre of mass, etc." denotes unambiguously.

The acquaintance/description distinction brings out a marvellous insight into language use—an insight which is obfuscated by Russell's later, quite unnecessary, forays into an epistemology based on sense-data and related notions. In *The Problems of Philosophy*, for example, Russell used this distinction notoriously to argue that we can know physical objects 'indirectly', even though we are 'directly aware' only of sense-data. All of this seems to me to be quite unwarranted; the acquaintance/description distinction makes sense *within* our ordinary, 'topic-neutral', ways of speaking. Thus, all of you are acquainted with me right now as I speak[24]—you can say "That person over there". You can as well talk *about* me in my absence, as "The first speaker on, etc.".

Still, the distinction is important. Given a certain twist in terminology, the importance is nicely captured recently by Barwise and Perry: "Definite descriptions seem to give us a 'further reach' than indexical expressions, a reach that allows us to pluck objects from all manner of resource situations".[25] Thus, in your current 'resource situation' in which I am, say, perceptually accessible, a use of an indexical "That person over there" suffices. You would want to use a definite description "The first speaker on, etc." in a 'resource situation' in which I am no longer so accessible. In traditional terms, definite descriptions allow singular denotation much beyond *ostension* and, thus, have a 'further reach'. These, then, are Russell's conditions on definite descriptions: definite descriptions allow *both* singular denotation and a 'further reach' when used non-vacuously. These plus the 'uniqueness condition'.

Notice that, so far, Russell has not placed any other constraint on "*G*" except that it must be in the singular. So, maybe, Russell's theory extends to the denoting phrase "The kite", as in "The kite is black", which can be used by a native speaker to make a true statement. However, according to Russell: "*the*, when it is strictly used, involves uniqueness ... when we say '*X* was the father of Charles II' we not only assert that *X* had a certain relation to Charles II, but also that nothing else had that relation ... ." We may think of the uniqueness condition as settling to the satisfaction of the language community, prior to the making of the assertion, a definite answer to the question, 'How many things *G*?' Answer: 'Exactly one.' On these grounds, Russell argues, although we sometimes say "*The* son of so-and-so" even when so-

and-so has several sons, it would be *more correct* to say "*A* son of so-and-so". Similarly, knowing that there are millions of kites in the world, we should never say "The kite is black"; we should say "A kite is black".

Construed as a proposal for language-reform, this is simply intolerable. When I want to say "The kite is black", I want to say precisely *that;* if I wanted to say "A kite is black", I would have said *so*. Moreover, this proposal seems all the more absurd, if we remember that for Russell "a kite" means the same as "some kite".[26] Otherwise, according to Russell, if I insist on the 'strict' interpretation of "The" in saying "The kite is black", I would *always* be saying something false. So the problem is this: although we can think of many commonplace 'resource situations' in which an English speaker would correctly and successfully say "The kite is black", he would be saying something false if by "The kite is black" he means 'one and only one kite is black'. Russellian truth-conditions do not match usage.

The usual moves in this situation, Russellian or otherwise (i.e., moves other than the proposal for language-reform), consist, in general, in a further specification of contexts to which the 'one and only one' part of the assertion must be relativized. A Russellian move would consist in 'eternalizing' an elliptical use of "The table" as, say, "The table in the far left hand corner in room 363 of Hagey Hall at the first instant of 1985", and then giving a Russellian analysis of this supposedly 'eternalized' sentence. As Wettstein has shown,[27] there are indefinitely many ways in which "The table" may be 'eternalized', any of which or even *none* of which might be the appropriate semantic reference of 'The table'. Nothing much is gained in the attempt to build the context of utterance *within* the 'eternal' sentence itself. Thus, a non-Russellian move would relativize an utterance of "The table", from the outside, with respect to an ordered n-tuple of contextual co-ordinates for world, time, place, etc. We may even introduce an explicit demonstrative operator ('Dthat' ["The table"]) to handle various logical problems. Details need not detain us here.[28]

Yet, the point remains that the effect of *singular* denotation for "The kite" cannot be achieved without such context-relativization. *With* such relativization, the phrase "The kite" behaves *almost*[29] like demonstratives. Thus, given the elaborately specified context, "The kite is black" says nothing more than "That thing is black". Roughly, an utterance of sentences like "The kite is black" involves a story of the following sort: a unique object is somehow fixed in advance for the speaker and the audience; the utterance of "The" in the utterance of "The kite", then signifies that a member of the class denoted by "kite" has already been so fixed. Most[30] uses of "The kite", then, if we so prefer, are referential uses. Moreover, most uses of "The kite" are accompanied by an access to the object either with the object in the current field of perception or in the short-term memory. There is a variety of cases then where a definite description cannot be used to achieve a 'further reach'.[31] A referential use of "The kite" is linked to the non-Russellian character of "The kite" with or without speaker's reference.

III

The story of "The kite" is very far from the classical story that definite descriptions allow a speaker/audience to pick out a unique object 'unambiguously' solely by virtue of 'identifying descriptions', by virtue of the 'sense' of the predicates. Fortuitously or not, philosophers have traditionally chosen the following definite descriptions, among others: "The centre of mass of the Solar System", "The first line of Gray's Elegy", "The first man on the moon", "The author of Waverley", "The father of Charles II", "The inventor of bifocals", "The teacher of Aristotle", "The president of U.S. in 1980", "The husband of Nancy Reagan", "The present king of Sweden".

Intuitively, each of these denoting phrases pick out (i.e., enable an audience to pick out) a unique individual without a 'presentation' of the individual. As such, each of them allows a more or less 'further reach' such that singular denotation is achieved primarily via general background knowledge. Just as the paradigmatic use of "The kite" is referential, so the paradigmatic use of "The present king of Sweden" is attributive. The difference between the two paradigms is captured by the flexible parameter of 'further reach'. How is the 'further reach' accomplished in the supposedly Russellian definite descriptions?

A moment's reflection tells us that, for each item in the list, the *singularity*, i.e., the unambiguity, of denotation is facilitated by a special sort of "*G*"s. Thus, in a monarchy, there is just one king for a country at a time; in a monogamy, there is just one husband for a woman at a time; in a presidency, there is just one president for a country at a time; biologically, there is just one father for a person. Also, somewhat strenuously: usually, in earlier times, there used to be just one author of a book; usually, in earlier times, there used to be just one inventor (or, one *known* inventor anyway) for a particular instrument. How does "The teacher" in "The teacher of Aristotle" enable us to pick out a single person? Perhaps by "teacher" is meant "teacher who had the most durable influence" which picks out a unique individual for each historically significant person for us. "The teacher of Wittgenstein", for us philosophers, does not pick out one of his high-school teachers, but picks out Russell!

Much as the singularity of "The kite" is relativized to, roughly, contextual factors, the singularity of "The present king of Sweden" is relativized to what we might call, roughly, 'Information factors'. Thus, a user of paradigmatic attributive phrases has to master a lot of information regarding institutional, mathematical, scientific and other matters before she can figure out the singularity of such phrases. But, once she has mastered such information of rather specific sorts, singularity becomes largely descriptional. The singularity of paradigmatic attributive descriptions is a matter of general, not local, knowledge.

IV

Descriptional singularity is a matter almost of *language*, if one's favourite view of language is Quinean. Quine identifies linguistic meaning with the widest of the community-wide beliefs;[32] the wider the community, the more robust the belief; the more robust the belief, the more the belief approximates linguistic meaning. We manipulate, Quine suggests, the parameter of width, and, thus, in turn, divide the speech-community variously, according to various practical conveniences. When a certain community, so divided, gets established in its own right, the members of the community share a certain general knowledge[33] in terms of their descriptive vocabulary which they can use to achieve singular denotation in a general way. Yet, there is nothing 'necessary' or 'linguistic' about such sharing.

The singularity of "author of X" and of "inventor of Y", as I have already suggested, are quite tenuous in these days of group research and publication. "Teacher of Z" is even more tenuous, and to fix that we need a surprisingly small community—philosophers, for example. "Husband of X" is more tenuous now than fifty years ago, "father of Y" is less so. It is not that, for "husband of X" the relevant general knowledge is shared by a smaller community, but because the wider community is changing the relevant general knowledge. Even "king of Z" was non-singular in ancient Sparta. On the other hand, many supposedly non-Russellian predicates are frequently used with 'further reach'. "The car", "The stereo" in a family; "The dean", "The secretary" in a professional community; "The school", "The hospital" in a village community. (Notice that the paradigmatic uses of these phrases are referential *with* some 'further reach'.)

'Mundane' objects like tables, cups, kites, ashtrays and suitcases cannot usually be referred with a 'further reach' unless some of them are of outstanding interest to a certain group. So, when they are talked about, they usually need to be present before both the speaker and the audience. Perceptual access, in such cases, creates a tentative community, and perceptual knowledge the relevant knowledge shared by such a community. Perhaps, 'community' is not the proper term for such accidental gatherings. Let us, therefore, settle for 'group'.

V

A group may be understood as any gathering of people using a language who share common knowledge of *mutual interest* of some portion of the world—real, imaginary or abstract; members of the group also share knowledge about the (potential) activities of each other. Groups are *stable* when the members of a group share a *history* of participation either in a pre-arranged institution (church, office, nation, research laboratory, etc.) or in social formations of their own (family, friends, clubs, reading circles, etc.) . Or a group may be formed accidentally with the relevant portion of the world laid out in front of

them. Needless to say, an individual may participate in more than one group, and the extension of his predicates will 'chunk' out relevant portions of the world accordingly. When discussing an office-memo, "The president" is chunked to denote unambiguously a head of office; when debating foreign policy, "The president" is chunked to denote a head of state.

I shall continue to exemplify the notion of chunking by using "chunk". The intuitive idea is the following: predicative expressions in a language (typically, simple monadic predicates) are learnt by native speakers in accordance with something like Putnam's 'Principle of Social Division of Linguistic Labor'.[34] Predicates are *chunked* when a certain group stereotypically refers to items of mutual interest that fall within the range of a Putnamian predicate. Whether these items form a mere subset or a proper subset of the range of the predicate depends on the width and stability of the group concerned. Stereotypical reference, for the group, would usually be supplemented by all sorts of local collateral information. An empirically useful definition of "chunk" will have to await advances in psychological theory which would tell us how the uses of predicative expressions are accompanied by structured collateral information.[35]

Another, closely similar, way of looking at the notion of chunking is as follows. Most predicative expressions, when used, contain explicit or implicit indexical elements. Chunking may be thought of as a common (cognitive) act of specifying these indexical elements in the same way by a group.

All (communicative) uses of language are performed with respect to a certain audience sharing common knowledge with the speaker. When the knowledge shared is by virtue of participation in *stable* groups, i.e., communities, the group concerned has a long 'further reach'; they can pick out the relevant object unambiguously whenever they are speaking among themselves in a wide variety of 'resource situations' just by virtue of their participation in the stable group.

Perhaps the farthest reach is provided by groups sharing mathematical knowledge. "Least prime" is possibly as 'thoroughly descriptional'[36] and Russellian as one can get. There is just one way of chunking the ordered world of numbers. Among empirical phrases, superlatives work best when things can be ordered to map on to positive integers. "Shortest spy" works, because spies can be ordered in an order of magnitude to create the effect of "First spy when spies are arranged in an increasing magnitude of height" given that there are no duplications. Non-duplication is guaranteed for the ordering of numbers, not so guaranteed for spies or fish in the ocean.[37] So, strictly, even "shortest spy" or "largest fish in the ocean" are not Russellian.

The social world elicits another kind of ordering in terms of heirarchies in the social institutions. Given a particular chunking, the structure of the institution is reflected in the predicates used by a stable group. Since in all

these situations the predicates themselves, relative to the chunking performed by the stable group concerned, effect singularity, should we say, as some authors have suggested recently,[38] that the uses of "The" preceding such 'Russellian' "*G*"s are superfluous?

Yet, such mathematical, scientific and institutional knowledges are one thing, knowledge of language quite another. Correct uses of "The" signify the knowledge of language of an English speaker. She uses it whenever she already shares with her audience the chunked reference of the predicate she is going to use next. A use of "The" signifies, across the board, that the speaker is 'in tune' with the audience regarding the subject-matter of discourse, whatever be the current state of non-linguistic knowledge she shares with the audience.[39] Uses of "The" take place in a gathering of same-*G*-chunk-knowers.[40]

If a speaker does not yet share a knowledge with her audience, she first *introduces* the knowledge element—"A man came to my office today"—thus forming a local group and *then* uses the definite article: "The man was selling Encyclopaedias." A friend of mine walks into my office one morning and says: "The movie was great." If he is not speaking to himself, chances are that he told me the day before that he was going to see *A Passage to India* or something; otherwise, if he merely *thought* he had told me so, he invites my surprise—"I didn't know you went to a movie".

These examples have some further theoretical interests. I shall mention, very briefly, two such interests:

(1) It is possible to notice here the dispensability of speaker's reference in favour of group reference even for anaphoric constructions. In the first example, an anaphoric use of "The man" is preceded by a securing of group reference; in the second, a speaker's merely 'having some object in mind' is not enough for successful communication. A choice between the notions of speaker's reference and group reference may not simply be a matter of taste.

(2) If there is a feeling that the ensuing account is *over-general*, that *all* communication take place in the context of same-knowers, the first example, in particular, should help. Quantified expressions "A man", "All men", "Some men", are usually used to *introduce* knowledge and prospective referents; "The" is used to *carry on* with the knowledge so introduced. The real novelty, in an use of "The *G* is *F*" for an audience, is in "*F*". Here, then, is a glimpse of how quantified expressions are to be non-trivially marked off from definite descriptions pending detailed examination of some apparently obvious counter-examples.

We share a largely true picture of the world, as Donald Davidson has so powerfully emphasized in recent years,[41] to be able to use language at all. That makes us general same-knowers. But we still need to cut that general picture down to various shapes for our referential needs. We still need to be

same-*G*-chunk-knowers. An use of "The", in my view, signals the achievement of that additional step.

Without getting into further details, the general picture should be reasonably clear by now. Paradigmatically, "The *G*" is used attributively in the context of stable and wide groups sharing a variety of general knowledge about chunking-relative unambiguous denotations. Russell's theory applies to a small and extreme fringe of such cases in accordance with Russell's interest in mathematical knowledge and his interest in the workings of a perfect language. Paradigmatically, "The *G*" is used referentially in the context of unstable and narrow local groups sharing a variety of short-term knowledge (either introduced by the speaker or available via perception). Human groups, however, are seldom absolutely stable or absolutely unstable. Given the structural variety of 'resource situations' in which human beings need to communicate with each other, these paradigmatic uses easily flow into each other, condensing at some points, thinning out at others but generally staying on the line of group reference.

So, just to recapitulate on this picture: "The least prime" is primarily used attributively; "The man over there" is primarily used referentially (even if someone said "The man over there, whoever he is"); "The winner of the Indianopolis race 500", "The murderer of Smith"—all these can be used both referentially and attributively since the referents of these phrases may either be within 'reach' or can be (mentally) located via structured knowledge about winners of races and rarity of gang murders. Given that our referential devices exploit the structure of our group-behaviour, we can think of the dual uses of "The *G*" as clustering in a middle area on the line of group reference and then gradually petering out to the extremes of single uses.[42]

Whatever is the reference (extension) of "*G*", "The *G*" always refers to the reference of "*G*" as chunked by a group. Group reference is, if we so prefer, an inherently pragmatic notion, and so is the notion of truth for an assertion of the form "The *G* is *F*". When a group is wide and stable enough to cover the entire population of English users, the group reference of "The *G*" may approximate, if we so prefer, the *semantic reference* of "The *G*". Semantic reference, then, is totalitarian group reference.[43]

The notion of group reference can, then, be used to give a unified account of the entire spectrum of definite descriptions from the most 'perfect' ones to the most 'imperfect' ones including the dual uses of some of them that cluster in the middle. The account is unified in that the uses of "The" do not vary; what varies is the group reference accompanying "The". Since uses of "The" do not vary, the account easily covers plural noun phrases; whether the relevant group reference concerns one "*G*" or many "*G*"s or exactly one "*G*" is to be read off from the particular "*G*" itself by the knowledgeable members of the group concerned.

Up to this point, this account has a significance for at least one aspect of the Russell-Strawson-Donnellan debate. In his original paper,[44] Donnellan

complained that both Russell and Strawson tell only half of the story: Russell tells the non-referential (i.e., attributive) story, while Strawson tells the referential story. A complete story, for Donnellan, involves both. Further, for Donnellan, a complete story involves a sharp distinction. If I am correct, Strawson's insight can now be generalized as follows: *all* uses of definite descriptions are group referential; Russellian definite descriptions, if any, are just special cases of group reference under conditions quite external to linguistic knowledge of "The". Russell did not tell even half the story.

VI

The preceding account does not yet supply an account of what Donnellan[45] thinks is the hallmark of referential uses. While, in our account, reference is achieved via the referent(s) *fitting* chunked "*G*"s, a referential use, for Donnellan, is independent of whether the referent fits "*G*" at all. Thus, in his classic example, someone might say (presumably pointing to a man over there), "The man over there drinking champagne is happy tonight", to which someone else might remark; "He is not drinking champagne, he is drinking water." Probably, *no one* in the 'vicinity' ('over there') is drinking champagne. So, no one, apparently, fits the chunked "man drinking champagne", yet the correct referent (signalled by the two uses of "he") is picked out by the audience.

This sort of example is somewhat different from classical examples like "The (present') king of France is bald" uttered when France is no longer a monarchy. To mark off this difference, I shall label Donnellan's example as a case of 'misdescription'—the description fails without a 'failure of reference'. The classical cases I shall label 'vacuous description'—reference 'fails' by virtue of the failure of description.

If we are not in the grip of some fairly strict notion of semantic reference, then it seems to me that examples of misdescription are of no theoretical consequence for an understanding of uses of "The". Donnellan observes[46] correctly that 'a speaker means something by an utterance when he has a certain complex kind of intention involving recognition on the part of his audience of his intention'; it is simply not the case that anything goes. What goes depends on the circumstantial knowledge shared by the group. The very fact that an audience, in Donnellan's case, is able to pick out the referent testifies to some shared knowledge around "man over there drinking champagne". The shared knowledge concerns the chunked reference of "man over there", the pointing gesture, perceptual similarities between drinking champagne and drinking water, and so on. The case is obviously interesting from a psychological point of view: just how is the information contained in "champagne" overlooked for achieving reference? But this psychologically interesting question has nothing to do with the linguistic knowledge of uses of "The"; "The", as usual, signals an achievement of group reference.

VII

Examples of vacuous descriptions, however, are a wholly different theoretical matter. For us, such cases are theoretically significant in at least two ways. First, according to our account, an use of "The" must be preceded by some shared knowledge. In an use of a vacuous description, however, there is simply no such knowledge to share.[47] Secondly, we may be inclined to set up the (pragmatic?) truth-conditions for "The *G* is *F*" simply as follows: "The *G* is *F*" is true just in case the group referent(s) of "The *G*" satisfies "*F*"; it is false just in case the group referent of "The *G*" fails to satisfy "*G*". But we still need to specifiy a condition for the case in which "The *G*" does not have a group referent at all. Russell and Strawson address the problem as follows.

Suppose that France, at *t*, is not a monarchy. Suppose further that someone, in fact, says at *t*, 'with a perfectly serious air': "The king of France is wise" (call this sentence '*S*'). How should we evaluate the truth-value of *S* as uttered by some one at *t*? Given the pre-theoretical agreement that *S* is a perfectly meaningful English sentence, Russell was pursuaded that both "The king of France is wise" and "The king of France is not wise" should have the value false without violating the law of excluded middle. This identification of the problem was then followed by the 'quantifier' interpretation of "The" and the subsequent scope distinctions. Strawson suggests that, since an utterance of *S* at *t* involves a 'reference failure', the question of *S*'s truth-value does not arise.

Given our interest in the communicative function of language, we need not enter the Russell-Strawson debate right now; for we still have to make sense of the idea of someone uttering *S* at *t* 'with a perfectly serious air'. *We* cannot begin to appreciate the problem until further details about who refers (or fails to refer) with what background for whom are supplied. We need these details, since we do not assume that all language users necessarily participate in a homogenous group. Faced with the paucity of these details in the literature, we will have to strike out mostly on our own. I would suggest the following case to generate most of the interesting possibilities.

A native, *X*, has been brought up entirely under a monarchial system, and he has no idea about alternative political systems. *X* also knows how to identify the king of a country, e.g. when the king gives a public speech, the national flag is displayed behind him. In sum, all the (non-verbal) paraphernelia that is usually associated with heads of states, in general, is also associated with *X*'s idea of a king. While *X* was visiting U.S., he remained, due to academic pressure, totally insulated from the general political scene except for listening to Ronald Reagan a couple of times on the T.V. *X* says: "The king of U.S. is friendly towards the Russians." Who's listening? I can envisage three sorts of audience. I shall presently describe one member from each sort.

Before I do so, notice that there is absolutely no requirement in the case that the native's own language is non-English. It seems to me that a case

similar to the native's would obtain for most *American* pre-schoolers. Knowing that kings and queens are the only political entities a child ever encounters in her story books, we are likely to say to the child, while pointing at Ronald Reagan: "He is like a king, honey." Since the child does not understand what it is to be *like* a king and yet still not *be* a king, the child infers that she is looking at a king. So the case can easily be construed as a genuine case of homophonic indeterminacy due to differences in collateral information. The child, like the native, simply does not know and does not care that U.S. is not a monarchy.

Here, then, are the three personalities. *Y* is another native who has been to U.S. a few months before and is now jealous about the attention *X* is getting from the fellow-natives. It is likely, then, that *Y* would show off his knowledge of U.S. by contradicting *X*. LeRoy is a friend of *X* who knows a lot about *X*'s country and the native's ways of thinking. LeRoy and *X* were together watching Ronald Reagan on T.V. last night. John Smith knows nothing about *X* or his country, and he was just passing by when *X* made that astonishing remark in plain English. How did they react individually? Ignoring the details of time and country, here is what happened.

Y, the other native, remarked: "I did not find him friendly towards the Russians at all" (Case 1). LeRoy decided to play along and said: "Well, I think you would change your opinion, if you listened to that one about bombing the Soviet Union in the next five minutes" (Case 2). John Smith stared at *X* for a moment and said; "I think you have got your politics mixed up, U.S. has never been a monarchy" (Case 3). Notice that all these variations in response obtained without varying the *native's* assertion, or, for that matter, without varying the native's 'mind'. The native is referring (or 'failing to refer') in the same way throughout.

Let me, first, discuss Case 2 only to set it aside, for the time being. How could LeRoy 'play along' when, for LeRoy there is no king of U.S.? LeRoy, obviously, is construing the use of "The king of U.S." as a referential use based on his short-term knowledge of last night. Moreover, given his general knowledge, he also knows that "The king of U.S." *could* be used attributively in the native land. Thus, despite the oddity of the native's utterance, there is no massive referential tension for LeRoy. Case 2, I shall assume, is similar to Donnellan's example of misdescription, and, therefore, we may ignore it.

As for Case 1, it is clear that *Y* has picked up the correct reference (signalled by his use of "him") without any referential tension whatsoever. Moreover, he has picked up the correct reference both referentially and attributively. Thus, within the native dialect, he is surely *contradicting X*. This would be certified not only by LeRoy who agrees with *Y*, but also by other native listeners for whom "The king of U.S." has been used purely attributively. The other natives, I would think, would be justified in holding that one, not both, of *X* and *Y* is telling the truth. John Smith's Russellian verdict

that both *X* and *Y* are asserting something false plainly would not count, nor would John Smith's Strawsonian verdict that *X* and *Y* are asserting nothing at all. If, however, Russell and Strawson individuate language by dialects, then there is no problem.

In Case 3, John Smith has an access, if at all, to the reference of "The king of U.S." as uttered by *X* at *t* only attributively. Since he does not have any such access, Donnellan would suggest[48] that 'one or the other of the two views, Russell's or Strawson's, may be correct'. But why should John Smith's verdicts count in, say, Ohio, but not in the native land, given that the native has asserted in the same way in both cases? How should we explain the logical nightmare that the same native assertion changes truth values depending on where it is asserted? There is something wrong, then, with the (in particular, Strawson's) notion of 'reference failure' *simpliciter*.

However, if we take the audience seriously into account, i.e., if we generalize Strawson's notion of reference failure to failure of group reference, we may explain the cases even while keeping the native assertion 'fixed'. In Case 1, "The king of U.S." obviously has a group reference; hence the question of truth and falsity arose. In Case 3, there is still the native's reference of "The king of U.S.", but there is no group reference; hence the question of truth and falsity, apparently, does not arise. The question of truth and falsity does not arise for the perfectly good reason that a *communication* between *X* and John Smith never got started. In general, it seems to me, dialects can always be cut finely enough to render alleged cases of vacuous descriptions as cases of *dialect transgression*. Working now with a notion of 'truth in a dialect', we may not need to specify a *third* truth condition for vacuous descriptions.

However, moving away from the Russell-Strawson debate now, what importance should we attach to cases of dialect transgression? How would John Smith react, for example, to his own child when the child says at *t*; "The king of U.S. is old?" Would John Smith immediately embark on a lecture on the American politicals ystem? Or, would he stop the child saying: "I don't know what are you talking about?" Most parents, I would think, would do neither. If they cannot pick out the child's referent from local, contextual knowledge, they would start asking questions, search their memory, and, in general, try to find a group reference for "The king of U.S." under the assumption throughout that *the child must be having a referent 'in mind'*—a referent that must be publicly accessible somehow. Human communication, in general, *is human*. I doubt very much that there are descriptions which, even after all such tries, remain intrinsically vacuous when some one says something 'with a perfectly serious air.'[49] I am unsure, therefore, about how much philosophical weight should be attached to alleged cases of vacuous descriptions.

NOTES

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1. Saul Kripke, 'Speaker's Reference and Semantic Reference', in French, Uehling and Wettstein (eds.), *Contemporary Perspectives in the Philosophy of Language*, Minneapolis, University of Minnesota Press, 1979, p. 22.
2. Except the standard restriction to definite descriptions occurring in the subject position of a simple subject-predicate sentence. In general, I shall not be concerned with definite descriptions in the predicate position. Another, fairly standard restriction would be added later. See note 47.
3. I am ignoring the possibility that some later uses of "The" might have been *influenced* by Russell's theory, especially in the philosophical community, e.g. 'Why is the free will problem so persistent? Partly, I suspect, because it is called *the* free will problem' (Daniel Dennett, *Brainstorms*, Bradford Books, 1978, p. 286).
4. Some of the empirical conclusions reached by me, e.g. the theory of a 'continuum' of shared knowledge (Section V) was also reached by some linguists (e.g. Geoffrey Leech, *Semantics*, Penguin Books, 1981, pp. 156-58). I find no indication, however, that Leech appreciates the significance of these conclusions for Russell's theory. Leech's use of the notion of 'uniqueness' is particularly confusing.
5. Double quotes are used throughout as mention-quotes. Single quotes are used for citation, and for ironical, technical and other non-standard uses.
6. Saul Kripke, *op. cit.*, p. 16.
7. "Referent" here may be construed as "referent *simpliciter*". Possibly what Russell 'had in mind' was semantic referent. But to build that into the statement of the theory itself, as Kripke does, is to prejudge a highly contentious issue. More of this later.
8. P.F. Strawson, 'On Referring' in *Mind*, July 1950; David Kaplan, 'What is Russell's Theory of Descriptions' in Yourgrau and Breck (eds) *Physics, Logic and History*, New York, Plenum Press, 1970.
9. Cf. Gareth Evans, *The Varieties of Reference*, Oxford, Oxford University Press, 1982, pp. 51-60, for a recent defence of Russell's theory from this point of view. See also, George Wilson, 'On Definite and Indefinite Descriptions' in *The Philosophical Review*, 87, 1978, pp. 48-76.
10. I am ignoring Montague's curious suggestion of attaching, in an Intensional Logic, an independent meaning to "The" *via* Russell's Strong Theory. Cf. Dowty, Hall and Peters, *Introduction to Montague Semantics*, Dordrecht, Holland, D. Reidel Publishing Co., 1981, p. 195.
11. Noam Chomsky, *Essays on Form and Interpretation*, New York, North-Holland, 1977, pp. 47-50.
12. Keith Donnellan, 'Reference and Definite Descriptions' in *The Philosophical Review*, 75, 1966.
13. These examples are from William Martin, 'A Logical Form Based on the Structural Description of Events' in Vaina and Hintikka (eds), *Cognitive Constraints on Communication*, Dordrecht, Holland, D. Reidel Publishing Co., 1984, p. 214.
14. Kripke, *op. cit.*, pp. 13-21.
15. The notion of speaker's reference was extensively used by Donnellan in his original paper. Kripke's contribution lies in showing that this notion, possibly, is a pragmatic one. I shall not discuss this controversial notion in this paper. But I shall throw enough hints at several places to suggest that this notion, along with the complimentary notion of 'semantic reference', may be theoretically dispensable.
16. Variations on this general theme are: primary/secondary reference (John Searle, 'Referential and Attributive' in *Expression and Meaning*, Cambridge, Cambridge University Press, 1979, pp. 137-61); effective/non-effective reference (D.E. Over, 'Effective and Non-effective Reference' in *Analysis*, Vol. 43, No. 2, March 1983, pp. 85-91); designational and non-designational reference (M. Devitt, *Designation*, New York, Columbia University Press, pp. 36-41), etc.
17. Kripke, *op. cit.*, p. 6, p. 22.
18. Alternatively, 'indefinite definite descriptions' (Donnellan), 'indeterminate descriptions' (Fitch).
19. Kripke, *op.cit.*
20. This line has been vigorously pursued informally in Howard K. Wettstein, 'Demonstrative Reference and Definite Descriptions' in *Philosophical Studies*, 40, 1981, pp. 241-57; more formally, in David Kaplan, 'Dthat' and 'On The Logic of Demonstratives' in French, Uehling & Wettstein (eds.), *op. cit.*
21. See also note 29 below.
22. Strawson, *op. cit.*, p. 341.
23. Bertrand Russell, 'On Denoting', in *Mind*, 1905.
24. Imagine this paper being verbally presented to an audience.
25. Jon Barwise and John Perry, *Situations and Attitudes*, Cambridge, The M.I.T. Press, 1983, p. 148.
26. Which is persuasively challenged in Wilson, *op. cit.*, pp. 48-53.
27. Wettstein, *op. cit.*, pp. 246-47.
28. See, Kaplan, *op. cit.*
29. This qualification is important. "The table" and "That table" may have similar uses, but it requires a lot of arguments and evidence to postulate redundancy in a natural system. In any case, Fitch ('Indeterminate Descriptions' in *The Canadian Journal of Philosophy*, June 1984) has argued that there are subtle differences in the uses of "The table" and "That table", even though both are, in a broad sense, context-dependent.
30. "Most", not "all'. Some authors (e.g. John Pollock, *Language and Thought*, Princeton, N.J., Princeton University Press, 1982, p. 108) have held mistakenly that an 'improper' definite description, if successful, can *only* be used referentially. Knowing that James frequently watches late night movies on T.V. on Sundays and knowing further that he is, as usual, late for work this Monday morning, I can say to his frustrated boss, in an attempt to save James' neck, "The movie James was watching must have been absorbing", without having the faintest idea of *what* movie James was watching last night. Of course, I would say this to an audience (i.e. the boss, in the present case) who shares similar knowledge about James' habits—that is the central point of this paper; this use of "The movie" is attributive, nonetheless. Linsky's example, "The table is the most important article of furniture in a dining room" (Leonard Linsky, *Referring*, London, Routledge & Kegan Paul, 1967, p. 63), however, won't do; "table", in Linsky's example, is used as a 'species' term, not a 'sortal' term.
31. I am ignoring here the complications generated by the anaphoric uses of "The table" which, in turn, seem to be linked to the phenomenon of speaker's reference. Cf. Keith Donnellan, 'Speaker's Reference, Descriptions and Anaphora' in French, Uehling and Wettstein (eds), *op. cit.*, Again, if the ensuing account is correct, a general theory of definite descriptions may not require speaker's reference as a theoretical construct.
32. Cf. W.V.O. Quine, 'Reply to Chomsky' in Davidson and Hintikka (eds) *Words and Objections*, 1969, p. 310.
33. *Knowledge*, not *object(s)*. Here I depart from the so-called "Locational" or "Shared Object" theory of descriptions proposed by Hawkins (John Hawkins, 'On Surface Definite Articles in English' in Van Der Auwera (ed.), *The Semantics of Determiners*,

Baltimore, University Park Press, 1980). Hawkin's theory has been critically discussed by, among others, Christopher Lyons ('The Meaning of English Definite Articles', in Van Der Auwera (ed.), *op. cit.*) and Thrane (Torben Thrane, *Referential Semantic Analysis*, Cambridge, Cambridge University Press, 1980, p. 185-89). I believe the ensuing theory is immune from such criticisms.

34. Hilary Putnam, 'The Meaning of "Meaning" in Gunderson (ed.) *Minnesota Studies in the Philosophy of Science*, Vol. 7, Minneapolis, University of Minnesota Press, 1975.
35. This notion has close parallels with the notion of chunking employed in work in Artificial Intelligence.
36. Cf. Nathan Salmon, *Reference and Essence*, Princeton, N.J., Princeton University Press, 1981, pp. 14-22.
37. Which makes it possible for us to say "One of the fastest runners...", but not "One of the smallest positive integers...".
38. See, Ruth Millikan, *Language, Thought and Other Biological Categories*, Cambridge, The M.I.T. Press, 1984, pp. 175-91. Millikan's suggestion thus precipitates yet another theoretically uneasy distinction between superfluous and non-superfluous uses of "The". Nevertheless, Millikan's discussion provides one of the most thorough taxonomies of the uses of "The".
39. Strawson (Strawson, *op. cit.*, p. 335) suggested that referring terms are used to forestall the question: 'Who/what are you talking about?' This suggestion is developed by Hawkins (*Definiteness and Indefiniteness*, London, Croom & Helm, 1978) in his 'Locational' theory of definite descriptions. If the preceding account is correct, then, so far as definite descriptions are concerned, a *use* does not forestall the question; a use signifies that the question has already been forestalled, *for the group*, prior to the use. Strawson's thoughts on this point, it seems to me, have changed somewhat subsequently. Thus, in 'Singular Terms and Predication' in *The Journal of Philosophy*, 58, July 1961, pp. 399-402, Strawson stresses that the 'identificatory function' of a singular term *must* involve 'the thought of some object *already within the reach of the hearer's own knowledge, experience, or perception*'. For an interesting discussion of this point, David S. Schwarz, *Naming and Referring*, Berlin, Walter de Gruyter, 1979, pp. 38-99.
40. Which suggests the possibility that, if the predicates of a language *come* chunked (possibly in a small and closed community where all activities are done in a single group), a definite article would be functionally superfluous. Presumably, such a community would still require the idiom "exactly one", e.g. in answer to the question, "How many arrows hit zombies?" Russell's analysis of "exactly one arrow hit zombies" would still apply without there being definite descriptions in the language! A similar point is interestingly discussed in Millikan, *op. cit.*, pp. 184-88. Of related interest is the discussion of 'non-present reference' in the American Sign Language in Ursula Bellugi and E. Klima, 'From Gesture to Sign: Deixis in a Visual-Gestural Language' in Jarvella and Klein (eds), *Speech, Place and Action*, Chichester, John Wiley, 1982, p. 301.
41. See, for example, Donald Davidson, 'On the Very Idea of a Conceptual Scheme' in *Inquiries into Truth and Interpretation*, Oxford, Clarendon Press, 1984, pp. 183-98.
42. It is surprising that authors, who emphasize the fundamental roles played by the notions of group and mutually shared beliefs in our understanding of communicative functions of language, nevertheless insist on a strict separability between utterer's meaning and semantic meaning to explain Donnellan's distinction. I have in mind authors such as Kent Bach and Robert M. Harnish, *Linguistic Communication and Speech Acts*, Cambridge, The M.I.T. Press, 1979, especially p. 287. However, Bach and Harnish's theory of ' communicative inference' does seem to provide a better understanding of the sort of cases discussed in Section VI, though I am unsure about the relevance of this theory for "The". Harnish's recent paper ("Communicative Inference: An Inferential Model' in *Conceptus*, 18, 1984) came too late in my hands for a careful study for this paper.

43. Replace "speaker's reference" with "group reference" and compare: 'a diachronic account of the evolution of language is likely to suggest that what was originally a mere speaker's reference may, if it becomes habitual in a community, evolve into 'semantic reference' (Saul Kripke, *op. cit.*, p. 22). I find the idea of a speaker's reference becoming 'habitual in a community' incoherent; how can the rest of the community have an access to what a speaker 'has in mind'?
44. Donnellan, 'Reference and Definite Descriptions', *op. cit.*
45. Donnellan, 'Reference and Definite Descriptions', *op. cit.*, pp. 283, 285; Donnellan, 'Putting Humpty Dumpty Together Again' in *The Philosophical Review*, 77, April 1968, pp. 204-06.
46. Donnellan, 'Putting Humpty Dumpty Together Again', *op. cit.*, pp. 212-14.
47. Apart, possibly, from the knowledge that "G" does not have a chunked reference. Why then is "The G" *used* in the first place except, perhaps, for asserting "The G does not exist"? But, then, what is the content of this last assertion in terms of our account? Like Donnellan ('Reference and Definite Descriptions', *op. cit.*, p. 284), I shall set aside such problematic cases from the present discussion, simply because such uses of "The G" are not referential at all.
48. Donnellan, 'Reference and Definite Descriptions', *op. cit.*, p. 283.
49. Except, perhaps, for cases like "The largest positive integer must be greater than a trillion". For most ordinary, non-mathematicians who cannot construct the relevant reductio proof, the description, I would think, is non-vacuous. *Once* we know the proof, however, I do not see how to achieve group reference with, for example, a child in the third grade. The only alternative, for the audience, in such global and purely abstract contexts, is either to change the subject or, indeed, to emabark on a lecture on number theory.

The axiomatic method: its origin and purpose*

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Euclidean Geometry and the Axiomatic Method

Euclid's *Elements* constitutes the earliest extant substantial presentation of a body of material in the axiomatico-deductive form.[1] Through it the subject of geometry got permanently associated with axiomatico-deductive formulation which was then viewed as a method, so much so that the expression 'more geometrico' (the geometric way) became synonymous with axiomatico-deductive formulation. Thus arose the general belief, especially in methodological quarters, that Euclid's *Elements* and, in particular, Euclid's geometry were merely instances of the application of a previously thought out/discovered/known method, and, thus, that the axiomatico-deductive method existed prior to the axiomatico-deductive formulation of geometry.[2]

Using Euclid's *Elements* as my principal evidence,[3] I want to suggest that the true state of affairs is the other way round. The axiomatico-deductive formulation of geometry emerged out of a successful attempt—most probably by some of Euclid's predecessors—to solve some geometrical problems. Once this was done, it was seen by these geometers and also, of course, by Euclid as an instrument of open-ended discovery. Only, then, could the germs of a method be seen in it.

My view of the genesis of the axiomatic method emboldens me to suggest further that in general a method, which is something consciously conceived, arises as the result of reflection on an activity that is already being pursued 'intuitively'. Again, once the method is consciously conceived, it can engender new activity being pursued consciously in accordance with the method, i.e. methodically.

The Geometrical Problems and Their Solutions

If the axiometic method arose as a result of reflection on some geometrical activity being pursued 'intuitively', what could this activity have been? I suggest that this activity was initiated by a problem which, although it is not explicitly posed in the *Elements*, can be solved on the basis of another problem which is explicitly posed and solved in Book II, Proposition 14, of the Elements: 'To construct a square equal to a given rectilineal figure.' This problem could well be called the problem of 'squaring a rectilineal figure'. by analogy with the name of a well-known problem of Greek geometry: 'squaring

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the circle.' (Euclid was not able to solve this latter problem, and, therefore, perhaps, does not mention it at all in the *Elements*.) Let us note that Book II ends with Proposition 14; I might say that our teaching and learning of geometry—and of the axiomatic method—ought to begin with this proposition which actually enunciates a problem.

But why is this problem of 'squaring a rectilineal figure' important? The comparison of two straight-line segments to find out whether they are equally long or not, and, if not, to find out which one of the two segments is shorter and which the longer is, practically speaking, a simple matter, if one is allowed to use a string or a rope.[4] Euclid solved this problem theoretically, allowing himself the use only of a straight-edge (to draw a straight line joining two given points) and of a pair of compasses (to draw a circle with a given centre and a given segment, of which that centre is an extremity, as a radius of that circle, i.e. without using a pair of compasses as a pair of dividers). In fact, this is reflected in his Postulates 1 and 3 of Book I. Euclid's solution of this problem of the comparison of two straight-line segments is given as Proposition 3 of Book I: 'Given two unequal straight lines, to cut off from the greater a straight line equal to the less.'

The corresponding problem for plane rectilineal figures is far from easy, even practically speaking. We may, where possible, move one of the two given rectilineal figures and try to place it on the other to see whether the two fit together perfectly, or whether one of them can be fitted entirely within the other. (Common Notions 8 and 9 of Book I reflect this approach. Common Notion 8: 'And things which coincide with one another are equal to one another.' Common Notion 9: 'And the whole is greater than the part.') But very often neither of these two things will happen, even if the figures have some definite and simple shape such as that of a rectangle. However, should both the figures be squares, superposition will always yield a solution; in fact, we need not even superpose the squares: we need only compare their sides. Note that this happy situation is based on the observation that any two right angles fit, and this requirement is what perhaps led the geometers to define a right angle the way Euclid does (Definition 10, Book I: 'When a straight line set up on a straight line makes the adjacent angles equal to one another, each of the equal angles is right'), and led Euclid to put down his Postulate 4, Book I: 'And that all right angles are equal to one another.'

Another important observation would have to be made before one could proceed further with the problem. A given figure can be cut up or decomposed into parts and these parts put together differently to obtain a different-looking figure. (This can be easily seen by cutting up a square into two equal parts and putting these together to obtain a rectangle.) Now, two such figures are not equal (in the sense of Common Notion 8), but there is someting special about them, namely, that their 'corresponding' parts are equal in the sense of congruence. At this point, the ancient geometers must have realized that

no further progress on the problem of comparison of figures was possible unless one was willing to regard two figures, which were equal in parts, to be 'equal'. This is, of course, a weakening or widening of the notion of equality of figures, and appears as Common Notion 2 in Book I: 'And if equals are added to equals the wholes are equals.' (The original Greek wording of this Common Notion does not suggest the notion of addition in a numerical sense; rather, it suggests 'putting together'—*prostethe*.) This broadening of the original notion of equality as congruence allows one literally to transform a given figure, i.e., change its form or shape, while retaining its 'size', i.e., while keeping the new figure equal to the original figure. The problem of comparison of two figures could now be 'reduced' to the problem of transformation of one figure into another through the techniques of 'dividing' and 'putting together'. But the fact that squares can be compared with ease would have suggested the following alternative. Suppose, instead of trying to convert one of the given figures into the other, one tries to convert both the figures into squares; and, suppose, it turns out that the converted squares are equal. Could we, then, assert that the two original figures were equal? The astute Greek geometers saw that this was not justified unless the notion of equality was weakened further; thus, we have Common Notion 1 of Book I: 'Things equal to the same thing are also equal to one another.'[5]

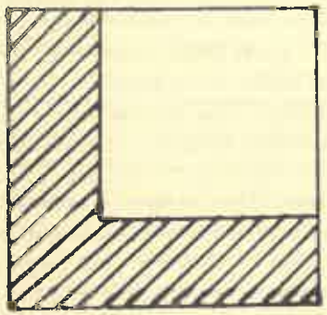
Having agreed to the broadening of the notion of equality (of figures) through the Common Notions 1 and 2, the problem of comparison of two figures is 'reduced' to the problem of squaring of a figure. Naturally, Euclid takes up the simpler case of a rectilineal figure, and, thus, arrives at the statement of his basic problem in Books I and II, Proposition II. 14; 'To construct a square equal to a given rectilineal figure.'

How does Euclid solve the problem? Or, rather, how did Euclid, or some predecessor, arrive at the solution we find given in the *Elements*? Certainly not by starting off with the definitions, postulates and common notions, and brilliantly deducing one theorem after another (there are forty-eight propositions in Book I and fourteen in Book II). The problem was solved by reducing it, in turn, to one or more problems. This approach to problem-solving was discussed much later by Pappus under the name of 'the Method of Analysis and Synthesis', but we find allusions to it already in Plato. The 'analysis' part involves the formulation of auxiliary or subsidiary problems in what later appears as a 'back tracking' when the solution is finally described in the 'synthesis' part.

Although a triangle would be the simplest rectilineal figure, for obvious reasons Euclid prefers to tackle the rectangle first. So the problem of squaring a rectilineal figure is broken down into two sub-problems: (*a*) the problem of squaring a rectangle (this construction is given in II.14) and (*b*) the problem of 'rectangulating' any rectilineal figure (this construction is given in I.45).

Euclid solves (*a*) essentially by transforming a rectangle into a gnomon (which is an *L*-shaped figure left when a smaller square is taken out of a

bigger square; see shaded area in the figure). A gnomon is clearly a difference of two squares, and we thus have the new problem of constructing a square equal to the difference of two squares. This problem can be solved perhaps if we succeed in solving the problem of constructing a square equal to the 'sum' of two squares; this is precisely what the famous Pythagorean proposition amounts to, and it is Proposition I.47, the last but one proposition in Book I, the last (48th) proposition being the converse of the Pythagorean proposition. Of course, Pythagoras' Theorem in the special case of the isosceles right-angled triangle was known to many civilizations before Euclid, and perhaps even before Pythagoras, and its 'truth' could be visually ascertained. It must have been natural to conjecture that the theorem was true for any arbitrary right-angled triangle, but this already presupposes a broadened notion of equality of figures. Indeed, Euclid makes use of this broadened notion in his proof of Pythagoras' Theorem by dividing the square on the hypotenuse into two rectangles and showing the 'equality' of these rectangles with the squares on the corresponding sides. Now, getting convinced about the 'correctness' of the Pythagorean construction for the sum of two squares required further backtracking and ultimately must have led to the inverted or backward construction of Book I, or something similar to it, perhaps by some predecessors of Euclid. This involves, in particular, getting convinced that the diagonal of a parallelogram splits it into two equal triangles, and that under certain conditions two triangles are equal. (Incidentally, Common Notion 3 is 'demanded' or postulated in claiming that the gnomon is 'equal' to an appropriate square.)



In his solution of problem (*b*), i.e., converting a rectilineal figure into a rectangle (in fact, Euclid gives a stonger construction I.45: 'to construct in a given rectilineal angle a parallelogram equal to a given rectilineal figure', and to effect that the construction I.44: 'to a given straight line to apply, in a given rectilineal angle, a parallelogram equal to a given triangle'), Euclid uses the obvious fact that a rectilineal figure can be easily decomposed into triangles, so that one is led next to the problem solved in I.44.

To summarize, I wish to suggest that investigations into the problem of comparison of two rectilineal figures led the Greeks before Euclid to the realization that some 'concessions' had to be made with regard to the notion of equality, which led to the formulation and investigation of some subsidiary problems, leading finally to a number of postulates, common notions and definitions. Having done this, they then reversed the whole process of thinking, making it appear to posterity that, almost by a miracle, from the small

'acorns' of a few innocent-looking definitions and postulates mighty 'oaks' such as Pythagoras' Theorem and II.14 could be grown. I have indicated this with reference to Books I and II, but the same could be said about the other geometrical books.

It should be noted, however, that the other non-geometrical books of Euclid's *Elements*, namely, those on natural numbers and general magnitudes do not invoke any postulates explicitly but are based only on definitions. So they could well have been the result of an application in the forward direction of the axiomatic method discovered by investigations in the reverse direction into some geometrical problems. Of course, geometers after Euclid—and even Euclid himself—did carry out further geometrical investigations in the forward direction, proving many interesting new theorems. Eventually, Lobachevskii and Bolyai followed non-Euclidean lines of exploration. This last step, after some initial resistance, later turned into reluctance, and a considerable delay of about fifty years led to our modern conception of the axiomatic method as the method of mathematics, involving notions of 'definition', 'axiom' and 'proof'.

The Purposes of the Axiomatic Method

Having discussed the possible genesis of the axiomatic method in rather great detail, I would like to turn to the several purposes or uses to which it has been put subsequently.

The Mathematical Use

As mentioned just above, the axiomatic method was put to use in mathematics no sooner than it was discovered, and thus it was recognized to be a powerful instrument of open-ended discovery or derivation. This had several consequences. Firstly, the process of 'derivation' or 'deduction' came under close scrutiny giving rise to the subject of logic, and I would venture the guess that Aristotle's investigations into logic were stimulated more by mathematics, particularly geometry, than by rhetoric or sophistic discourse. Eventually, this led to the feeling that logic was an engine of deduction which required only the turning of a handle to churn out new propositions from old. Now, deduction done by mathematicians—at least the human ones—are not so mechanical as that, but it is possible to automate the process of deduction, and this is, indeed, what has been done recently by 'theorem-proving programs'.

The second, and rather unfortunate, consequence was that the postulates and common notions, with the exception of Euclid's 'parallel postulate', were regarded as being 'true' in some sense and so irreplaceable. Logic was then seen as an engine to derive new, 'less obvious' truths from old, 'more obvious', 'self-evident' truths. I doubt if the Greek geometers themselves regarded their

postulates and common notions as 'self-evident' or 'true'. Three of the five postulates are not about propositions, that is, about any state of affairs in this world or in some other world. Rather, they are assumptions about what can be done in an ideal world. Of the other two postulates, equality of all right angles could have had some empiricism about it, but was finally assumed in order for some constructions to work. Finally, the 'parallel postulate' was necessitated by the somewhat empirical fact that parallel straight lines cut by a transversal produced equal angles, but this, too, was necessitated by the conception of a square, say, as having all angles equal and right (Definition 22). (Euclid's I.46 shows how to construct a square: 'On a given straight line to describe a square'.) The common notions were all required in order to surmount the problem of equality and comparability of (rectilineal) figures.

Of course, there was a happy side to the view that the postulates and common notions were self-evident. Thanks to the non-self-evident nature of the 'parallel postulate', it eventually emboldened geometers to abondon it, to replace it by something equally non-self-evident and then, working the engine of deduction, squeeze out some startling and "almost false" consequences. But this development, in its turn, had the effect that henceforth axioms (to use a single word for postulates and common notions) were deemed to be completely arbitrary and unprovable assertions, and, in an extreme view, even meaningless and having no relation with truth or reality whatsoever. This was accompanied by the view that definitions also were completely arbitrary, and one merely defined some terms (the 'defined' terms) 'in terms of' some other terms (the 'undefined' or undefinable? terms). Now clearly, for Euclid, definitions were far from arbitrary, though he stretched himself too far, trying to define almost every geometrical term. But it must be noted that nowhere did he or any of his predecessors say that terms like 'part', 'breadthless length', 'extremity', etc. were undefined in the modern mathematical sense of being devoid of any connotations. They were undefinable in a relative sense; they were simply left undefined in Euclid's formulation. There was nothing either undefined (meaningless) or undefinable about them.

However, towards the end of the nineteenth century there did arise a widespread view of mathematics that it consists of setting out some 'undefined terms' and some 'unproved propositions' at the 'beginning'; and then, after giving some definitions of defined terms as and when one fancies, of proving or deriving some other assertions on the basis of or from the unproved assertions using sheer logic or rules of inference. The American mathematician Benjamin Peirce said, 'Mathematics is the science which draws necessary conclusions'; and Russell confessed (with tongue-in-cheek humour) [3]: 'Thus mathematics may be defined as the subject in which we never know what we are talking about, nor whether what we are saying is true.' (One realizes, of course, that mathematics is a creative or imaginative activity, and not a routine, mechanical activity, because necessary conclusions do not 'follow' easily or automatically from the unproved assertions; rather, they have to be

conjectured and then 'drawn out' by hard work.) This open-ended view of the axiomatic method in mathematics leads one to believe that one is free to start with arbitrary undefined terms and arbitrary unproved assertions, and then to make arbitrary definitions in order to draw the conclusions, too, somewhat arbitrarily, i.e., as and when they occur to the mathematician, so that the whole thing is a stupendous exercise in arbitrariness! Of course, Russell himself realized that this was not so, for he said (about twenty years after his earlier quip) [4]:

> Mathematics is a study which, when we start from its most familiar portions, may be pursued in either of two opposite directions. The more familiar direction is constructive, towards gradually increasing complexity: from integers to fractions, real numbers, complex numbers, from addition and multiplication to differentiation and integration, and on to higher mathematics. The other direction, which is less familiar, proceeds, by analysing, to greater and greater abstractness and logical simplicity; instead of asking what can be defined and deduced from what is assumed to begin with, we ask instead what more general ideas and principles can be found, in terms of which what was our starting-point can be defined or deduced. It is the fact of pursuing this opposite direction that characterises mathematical philosophy as opposed to ordinary mathematics. But it should be understood that the distinction is one, not in the subject matter, but in the state of mind of the investigator. ... The distinction between mathematics and mathematical philosophy is one which depends upon the interest inspiring the research, and upon the stage which the research has reached; not upon the propositions with which the research is concerned.

I might add that many great mathematicians of the last hundred years or so have contributed a lot to 'mathematical philosophy' in Russell's sense, because they have contributed to the process of axiomatization of mathematics in the original Euclidean sense. Further, it must be added that usually one stipulates one or more of the following requirements for an 'arbitrary' set of axioms, namely, that they must be 'consistent', 'independent', 'complete', 'categorical'.

The Cartesian Purpose

The use to which Descartes sought to put the axiomatic method was the establishment of indubitable truths. A proposition about whose truth we are 'doubtful' (such as 'I exist') is sought to be established on the basis of some intuitively clear or indubitable propositions (such as 'I think'). Thus, the axiomatic method is an instrument for dispelling doubt and for creating certainty. Of course, the process of finding out whether a seemingly doubtful

proposition can, indeed, be indubitably established is one of back-tracking, quite similar to the back-tracking in mathematics, where a conjectured theorem is sought to be proved. But the difference is that in mathematics we do not bother about the 'truth' of the axioms, whereas in the Cartesian approach the 'first principles' have to be indubitable and thus true.

Organization of Knowledge

Another use that has been found for the axiomatic method is that of 'organizing a body of knowledge' or 'systematizing a discipline'. Here, it is supposed that we already have a set of truths somehow obtained, but these truths are perhaps too many or seemingly unrelated to each other. We then try to create some system or order by trying to discover whether a small subset of them can serve as a set of axioms from which all the rest can be derived. One may, of course, question the utility of such an enterprise. The whole exercise of organization is to start with the knowledge base that is already there. This base would include terms whose meanings we already know and assertions whose truth we are already confident of. But, if this is so, why bother to define the already known terms in terms of 'undefined' terms, and to derive the already trustworthy assertions in terms of some selected assertions? Perhaps one is trying to apply Ockham's razor here, i.e., one is trying to obtain simplicity. But simplicity in the form of a small number of axioms is won at the cost of complexity of derivations of the other truths from the axioms.

Discovering Unknown Causes or Hypotheses

In this application of the axiomatic method, one starts with a known body of truths with terms whose meanings are known. One then tries to discover a set of undefined and unknown terms, a set of definitions of the known terms in terms of the undefined and unknown terms; and, finally, a set of assertions whose truth is unknown in such a way that the known truths, when reformulated using the definitions in terms of the undefined terms, can all be derived from the axioms. This is, of course, the game of (scientific) theory construction. What is the point of such a game? Well, after the axiomatization, using the axiomatic method in the forward direction as an instrument of discovery, one may stumble across new consequences of the axioms, which, when reformulated using the known terms, give us propositions whose truth can then be ascertained. Their truth is not guaranteed, because the axioms are not necessarily (known to be) true. But the task of ascertaining the truth of new propositions can produce new truths which, otherwise, we may not have bothered to look for. The axioms could be called causes, hypotheses or principles of the body of knowledge or the science that one is dealing with. Success in this approach at the initial stages depends upon the size of the body of knowledge one starts with; usually, it does not pay to be too ambitious, but

one may gradually enlarge the body of knowledge and simultaneously modify the undefined terms, definitions and axioms, that is, the theory.

I may, finally add that perhaps one should not be too much preoccupied with 'truths'. Taking the cue from the initial axiomatization of geometry, one should perhaps be equally concerned with problems, and should try to discover an axiomatization in the course of the attempt to find acceptable solutions.

NOTES

1. Although the name 'Euclid' is almost synonymous with the word 'geometry', it should be noted that Euclid's *Elements* deals not only with geometry but also with (the natural) numbers, certain incommensurable geometrical magnitudes (and thus indirectly with a special class of irrational numbers), and a theory of general magnitudes. The *Elements* is divided into thirteen Books. Books I to IV, VI, and X to XIII deal with geometrical topics. Books VII to IX are concerned with natural numbers. Book V—a very interesting one but, unfortunately, rather overlooked by physicists and philosophers of science—contains a theory of general magnitudes, which is in many respects similar to algebra and lays the foundation of a theory of measurement. Each Book contains a number of propositions, which are either assertions (or theorems, in modern terminology), or problems. The theorems (for example, in Book I, Proposition 5: 'In isosceles triangles the angles at the base are equal to one another, and, if the equal straight lines be produced further, the angles under the base will be equal to one another') are followed by a demonstration of the correctness of the assertion (proof), ending in the proverbial 'Q.E.D.' (in the Latin version). The problems (for example, in Book I, Proposition 1: 'On a given finite straight line to construct an equilateral triangle') are followed by a construction and a demonstration that the construction, indeed, solves the problem, ending with the less familiar 'Q.E.F.'. Some Books (I to VII, X and XI) have some definitions stated at the beginning. Only Book I has some postulates and common notions following the definitions. (In today's terminology, these can be called 'specific axioms' and 'general axioms' respectively.)
2. Although both Euclid's name and the subject of geometry have become synonymous with the axiomatic method, unfortunately we do not find any elaboration of this method which says something about the genesis, evolution or purpose of the method, either in Euclid's *Elements* or in any extant work by his predecessors (such as Plato and Aristotle, among others). There is, for example, no preface to the *Elements*. Plato, of course, alludes frequently to the 'method of the geometers', and Aristotle has written in detail on the 'demonstrative sciences'.
3. My main source is the second revised edition of *The Thirteen Books of Euclid's Elements*' (3 vols.) translated from the text of Heiberg with introduction and commentary by Sir Thomas L. Heath and published by Cambridge University Press in 1925. The book was reprinted by Dover Publications, Inc., in 1956. The contents of the *Elements* have been put together in the appendix in Ian Mueller's *Philosophy of Mathematics and Deductive Structure in Euclid's Elements* published by M.I.T. Press in 1981.
4. The comparison of two line segments to find out which one is the longer and which the shorter is perhaps the earliest example of the idea of the comparison of two objects with respect to a given quality to detect which one of the two has 'more' and which one 'less' of the quality. I have argued in another paper being presented at this workshop ('The Genesis and Purpose of Quantification and Measurement') that this idea of comparison with respect to a quality is more primitive than the precursor of

the notion of quantity. The Greeks, and in particular Plato, talked repeatedly of the notion of 'the more' and the 'less', or 'the greater' and 'the lesser'.

5. Thus far, I have 'accounted' for three of the five Euclidean Postulates and four of the five Euclidean Common Notions in Book I. (Mueller lists one more Postulate and four more Common Notions, but these are not regarded as genuinely Euclidean and so are enclosed within square brackets.) This leaves only one more Common Notion (Common Notion 3): 'And if equals are subtracted from equals the remainders are equal' and two more Postulates; Book I, Postulate 2 is: 'To produce a finite straight line continuously in a straight line' and Book I, Postulate 5 is the so-called 'Parallel Postulate': 'If a straight line falling on two straight lines make the interior angles on the same side less than two right angles, the two straight lines, if produced indefinitely, meet on that side on which are the angles less than the two right angles.' Postulate 2 is obviously required in most constructions where a point is to be obtained by the intersection of two straight lines or of a straight line and a circle. As regards Postulate 5, Euclid 'postpones' the use of this postulate as far as possible; it is involved for the first time in proving Proposition 29: 'A straight line falling on parallel straight lines makes the alternate angles equal to one another, the exterior angle equal to the interior and opposite angle, and the interior angles on the same side equal to two right angles.' In fact, this Proposition could well have been taken as a postulate in place of Postulate 5. (The converse of this Proposition is contained in Propositions 27 and 28 which are proved without invoking Postulate 5, and this is incidentally the first occasion for Euclid to talk about parallel lines). I have put the verb 'postpones' in quotation marks, because, according to the view that I am putting forward here, this was not a deliberate postponement by Euclid on account of some inherent abhorence of the parallel Postulate, as alleged by many critics, but rather it was the last step along one line of progress in Euclid's 'backtracking' journey from Book II, Proposition 14 to the Definitions, Postulates and Common Notions.
6. One would immediately think of the Kinetic Theory of Gases as an example.

References

1. Euclid's *Elements*. See note 3.
2. Mueller, Ian. See note 3.
3. Russell, Bertrand A.W., 'Recent Work on the Principles of Mathematics' in *International Monthly*, vol. 4, 1901, pp. 83-101. Reprinted as 'Mathematics and the Metaphysicians' in *Mysticism and Logic and Other Essays*, London, Longmans Green, 1918. Issued as a paperback by Penguin Books Ltd. p. 75.
4. ———, *Introduction to Mathematical Philosophy*, London, George Allen and Unwin Ltd., 1919. Reprinted by Simon and Schuster.

Seeing in the mind's eye

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In this paper I wish to argue, through a critical discussion of two dominant theories of mental imagery, that a better understanding of the nature of mental images would be available to us if we recognize their kinship both to sentience and thought. The two theories to be discussed here, namely, the traditional empiricist view and the modern analytical view, can be placed at the two ends of an axis, the sentience-end and the thought-end respectively. My aim here is a heuristic one, that is, to throw light on our understanding of the nature of mental images by conceiving them as occupying an essentially indeterminate position in the middle of the axis. And the pertinence of such an 'interlinking' or 'synthetic' model would become clear upon discerning the implausibilities of the extreme views which are intent on identifying mental imaging either as a quasi-sensuous phenomenon or as a function of pure intelligence.

Separating out the Two Theories a La Ryle

Gilbert Ryle's analysis of the nature of perception given in the chapter 'Sensation and Observation' in *The Concept of Mind* provides a very useful cue for a systematic formulation of the two theories of mental imagery mentioned above. According to Ryle, there are two intermingled but conceptually isolable elements in the constitution of perception. One is the 'sensuous' element—the element by virtue of which seeing or hearing involves having visual or auditory *sensation;* the other is the 'thought' element—that which is responsible for the recognitional ability involved in the perceiver's *making out* what the sensation is a sensation of. The thought element is characterized by Ryle as 'in a strained sense, 'thinking' ' (Rlye 1949, 251). It is necessary to explain what this 'strained sense' is.

Ryle is against any view which holds that perception involves the occurrence of an active mental process of understanding which brings the passively received sense-impressions under a concept. Although both sensing and thinking are aspects of perceiving, these are not, for Ryle, two distinct states or processes coupled simultaneously in the way, for instance, 'humming and walking can be coupled together' (Ryle 1949, 212). Eschewing any tendency to regard thinking as a private mental process running through one's stream of consciousness, Ryle construes perceptual thinking as 'knowing a perception recipe' (Ryle 1949, 222), that is, coming to know how things of a particular sort can be expected to appear and behave, and, therefore, to be in a particular frame of mind (or disposition) in which such expectations occur.

The relevant question concerning the problem of perception, as Ryle suggests, is not 'What is an observer doing besides having sensations?' but 'What does the description of an observer embody over and above the description of him as having those sensations?' (Ryle 1949, 212) His answer is that the description is not a conjoint report of one incident in his sensitive life (e.g. having sensations) and another incident in his intellectual life (e.g. thinking conceptually); rather the observer should be described as having those sensations in a specific frame of mind or disposition. And to receive sensations in a specific frame of mind is to possess a particular perception recipe, so that the observer succeeds in recognizing what those sensations are of. For example, if he is perceiving a parrot, the thinking involved in this perceptual incident is tantamount to his recognitional ability, that is, his knowledge (perception recipe) of what a parrot looks like. And to have this recognitional ability *is* to be in a parrot-seeing frame of mind, the frame of mind of being ready to see both what he is now seeing and what he will see, or would be about to see. One might say that the observer's sensory intake is 'absorbed' in a parrot-recognizing frame of mind.

Using the metaphor of absorption, we can now represent the above analysis of perception in the following schematic way. To perceive X is to be explained by reference to some sensory awareness S of X and some recognitional capacity R that the perceiver is disposed to exercise in a given perceptual episode involving X. Thus, to say that X is perceived by someone is tantamount to saying that S is absorved in the observer's R-apprehending frame of mind. Or, to put it in another way, S is R-absorbed. The R-capacities constitute the perceptual repertoire that the observer retains in the form of certain dispositions. Perceptual thinking then consists in the utilization of certain R-capacities when S occurs as an effect of the perceiver's causal relation to X. And, in a similar vein of mind, one could also say that perceptual sensation consists in having certain X-generated S in a particular observational frame of mind.

Since mental imaging is not perceiving, what alterations in the above schema will facilitate us in formulating the nature of images *vis-à-vis* the structure of perception? The most obvious difference is that, when imaging occurs, there is no X that contemporaneously occurs to stand in a causal relation with the imager. The moot point, therefore, remains in the form of the two questions: whether (*a*) there is any S-awareness, or some awareness resembling perceptual sensation, which the imager interprets as 'seeing' (in the sense of 'seeing in the mind's eye') a picture or mental simulacrum of X; or (*b*) there is no S-awareness of any kind at all—no sense-experiential content whatsoever—but merely the observational frame of mind, the R-apprehending disposition, such that imaging consists in hypothetically utilizing the relevant R-capacities concerning how X appears, e.g. how a parrot looks like or how a tune goes. While (*a*) is committed to the view that mental imaging involves inner seeing of some shadowy replica of X, (*b*) dismisses

any talk about inner seeing and reduces imaging to a function of mere thought or intelligence—an intelligent act of hypothetically using a particular perception-recipe. We may now characterize (*a*) as the perceptual-sensation theory, the theory upheld by Hume and Hobbes amongst others, while (*b*) may be characterized as the perceptual-thought theory, which is principally due to Ryle but can also be attributed to some other analytic philosophers.

The Perceptual-Sensation Theory: Traditional and Modern

Hume believes that the human mind consists of nothing but perceptions which are of two kinds: impressions and ideas, that is, sensations and images. While impressions are immediate sense-contents and more vivid, ideas are faint copies or images of original impressions. There is thus no categorial difference between impressions and ideas; both are species of the same genus, namely, perceptions. Accordingly, ideas or images are also perceptual in character: they are the faint or less lively perceptions or, in Hobbes's words, 'decaying sense'. One experiences a lower degree of 'perceptual feel' in having an image than one would experience in having sense-impressions. Because of such a quasi-sensuous character or status of images, forming a mental image becomes a function of sentience or near-sentience. Ryle's succinct and elegant delineation of this view is to be found in the following passage:

> [A] mental picture, or a visual image, stands to a visual sensation in something like the relation of an echo to a noise, a bruise to a blow, or a reflection in a mirror to a face reflected. [I]t has been supposed that what is taking place, when I [mentally] 'see', 'hear' or 'smell', corresponds to that element in perceiving which is purely sensuous; and not to that element which constitutes recognizing or making out; i.e., that imaging is a piece of near-sentience and not a function of intelligence, since it consists in having, not indeed a proper sensation, but a shadow-sensation (Ryle 1949, 251).

This 'shadow-sensation' theory has two versions. One version is the 'private picture' view, according to which having a mental image involves picturing something in the private or inner space of the mind. In this view, images are mental entities to which only the imager has internal perceptual access. The second version may be termed the 'quasi-sensation' view, according to which the imager experiences something that is irreducibly akin to sensation. It is important to separate the overall perceptual-sensation theory into these two components, because some philosophers have subsequently tried to develop a theory that does not entail the emergence of a picture-like entity but entails only the having of a quasi-sensuous experience. This new version suggests that imaging is phenomenologically similar to perceiving, and it is this phenomenological similarity that the new version emphasizes.

We would do well to consider what reasons might have led the new theorist to subtract the private-picture version altogether. One reason seems to be that, while pictures are necessarily public objects, the concept of a private picture is a contradiction in terms. Secondly, the notion of a mental object that is neither like concrete material objects nor like abstract objects is highly troublesome.

Thirdly, even if we say that a mental image is a 'picture-like' something rather than a private picture, the analogy does not work. For pictures are things in their own right much as the things they are pictures of. This is why the properties that one ascribes to other material objects can also be attributed to pictures. The picture of a red apple is itself red: both the apple and the picture have the property of being red. But we cannot say that an image of a red apple is itself red, nor can we say that an image of an extended thing is itself extended.

If images were like pictures, they would be determinate. Even if the details of a picture represent something hazy or unclear, the fine details of the picture are never vague, indefinite or unspecific. The number of speckle-representing spots of paint on the picture of a speckled hen is determinate; but the number of speckles in a mental image of a speckled hen can be indeterminate. If mental images are not determinate, then they are not in any informative sense like pictures.

Furthermore, talk about introspectively confronting a mental picture entails ontological commitment to Cartesian mental objects. But we cannot provide any acceptable criteria of identity for such queer objects. And, as the slogan of the day goes, 'no entity without identity'.

Bereft of the private mental picture ontology, the perceptual-sensation theory might appear attractive and promising. Mental imaging, in this view, entails the occurrence of a quasi-perceptual experience without further entailing the emergence of a shadowy mental object. A contemporary protagonist of this view is P.F. Haynes, who writes:

> The single, most important fact about visual mental imagery is that it is related, somehow or other, to visual perception. ...The account of mental images that I wish to examine merely states that a visual mental image is nothing but a visual experience, i.e., nothing but an exactly similar kind of experience one has when one actually sees something (Haynes, 1976, 709).

If a visual mental image is as much an instance of visual experience as a visual perdeption is, how does seeing differ from 'seeing in the mind's eye'? Haynes does not overlook the obvious fact that 'seeing is not imaging and imaging is not seeing' (Haynes, 1976 709). So he adds that a visual perception differs from a visual mental image only in the 'circumstances' in which the visual experience occurs. While the visual experience of seeing

occurs in 'normal' circumstances—that is, when the object of sight is present in the immediate perceptual vicinity and causes the experience to occur—the visual experience of imaging occurs in 'abnormal' circumstances in which the causes of that experience do not include, simultaneously with the experience, the object of the experience.

If the circumstantial difference alluded to in distinguishing imaging from perceiving brings causation into the picture, it may be considered whether a causal account of the occurrence of mental images is also in order. Haynes himself hints that the difference between imagery and perception may be a function of their different causal ancestries. But he acknowledges the immensely complicated nature of the task of tracing the causal path from the imaging experience back to the object which the image is of. He also fears the possibility of conceptual counter-examples to any such causal story. Thus he suggests that we ought to look for some non-causal condition as marking visual imagery from visual perception. But he does not deny the relevance of causal criteria; rather he takes causal considerations as warranting him to refer to an epistemic differentia. Since Haynes takes it that 'perceptual causal chains lead back to the world, while image causal chains do not' (Haynes 1976, 718), it follows for him that the former type of chain, and not the latter type, gives rise to an experience that warrants a knowledge-claim of a certain sort. So he concludes that 'a visual mental image is nothing but a visual experience that provides no support for a certain kind of knowledge claim' (Haynes 1976, 719).

Haynes' theory can be criticized on two points. First, modelling the causality of mental imagery on the causality of perception is to follow the wrong track. Indeed, causation in mental imaging is significantly unlike causation in perception, as Bertrand Russell rightly points out. In *The Analysis of Mind*, Russell says that a visual mental image is 'centrally excited' or internally aroused, whereas a visual perception is caused by external circumstances (Russell, 1961, 150). In other words, unlike the percept which is causally related to an external stimulus or object, the image is caused by the thought of the object of which it is an image. So what appears appropriate to the explanation of mental imagery is mental or internal causality.

Secondly, the point rightly to be made is not that the experience of imaging does not warrant a knowledge-claim about the object, but that forming a mental image of something presupposes prior perceptual knowledge of the thing. The fact of the matter, therefore, is not so much that image-experience lacks the privilege of having an epistemic status, which perceptual experience naturally possesses, as the fact that the former is logically as well as genetically dependent on the latter. Hence the epistemic distinction drawn by Haynes is, though a valid one, beside the point unless the logical dependence of the concept of mental imagery upon the concept of perception is highlighted.

Apart from these two specific critical remarks on the attenuated version of the perceptual-sensation theory, one can legitimately raise the objection

against the overall theory that it hardly takes into account the *intentionality* of mental images, i.e., this theory underplays the fact that imaging is a form of thinking as well. Since having a mental image of something is entertaining, consciously or unconsciously some sort of thought about the object follows from the fact that mental imagery has the intentionality characteristic of thought. An image is always an image *of* something; and one can only form an image of what one can also think of. Besides, a mental image is identified by reference to the thought of how the object appears, for the image has no identity independently of our thought of the object, that is, independently of the way we identify it. As such, there seems to be enough reason for construing mental imaging as a kind of 'experiential thinking' as distinguished from purely non-experiential propositional thought. But, before we develop this idea, let us examine what the modern analytical views are on the nature of mental images.

The Perceptual-Thought Theory : Dilman, Ishiguro and Ryle

Concentration on the thought-component of perception becomes the preoccupation of some analytical philosophers' theories about mental imagery. They take the Wittgensteinian idea of 'seeing as' as betokening a solution to the problem of images. Seeing a photograph or a portrait as a representation of someone is taken to be a case of 'seeing X as Y' or 'seeing Y in X'. They argue that there is a logical affinity between the concept of seeing in a photograph or portrait what is pictured or depicted and that of seeing something in the mind's eye. For in either case—seeing Y in a portrait and seeing Y in the mind's eye—the 'seeing' is internally connected to the thinking of Y.

First, more about seeing X as Y as the schema of 'representational seeing', that is, seeing, for instance, a person depicted in a portrait. When admiring a particular portrait of Mahatma Gandhi, do we see the great freedom fighter of modern India or just see his likeness? In one sense, of course, we can quite properly be said to see the person, for it is Gandhi who is portrayed. But, in another sense, we cannot be said to see Gandhi, because he is not there *in proporia persona*; instead, we can be said to see the painted canvas. These two senses of 'seeing' can be termed, using Elizabeth Anscombe's phraseology, 'intentional seeing' and 'material seeing' respectively (Anscombe, 1965, 155-80). Representational seeing is intentional seeing; but it is not intentional seeing *per se*, because our intentionally seeing Gandhi is caused by our materially seeing the painted canvas. So material seeing is a causal component of representational seeing. And our intentional seeing of Gandhi consists of our thinking how Gandhi looks, this thought being occasioned by the material seeing of the painted canvas—the painted lines and patches as contours and surfaces of Gandhi's face and meagerly clad body. The figure on the painted canvas gives 'figurative content' to our thought of Gandhi, so to speak.

Is having a mental image also a kind of representational seeing, a case of seeing Y in X? Ilham Dilman contends:

> [If] a man who sees a star in his mind's eye is said to have formed the image of a star, this does not mean that he sees a figure that is star-shaped when nobody else does so. It means that he has *depicted* for himself a star. He could have done so by tracing one with his finger in the air, or he could have drawn one on a piece of paper. What is in question is the *image* of a star in the sense that it *depicts* a star....In fact, one could say that the image is a *form* which his thought of the star takes (Dilman, 1967, 20-1).

In this passage Dilman is trying to avoid any construal of a mental image as a private mental picture, which can only be introspectively observable to the imager. He is saying that the image of a star is not an object in its own right, a shadowy replica of the actual star. Imaging, he adds, 'is much more like thinking of a star, of having a star in one's thoughts, than seeing one—whether it be a real star or an after image' (Dilman, 1967, 21).

But soon Dilman falls into incoherence. For he seems to treat the image as *something* that depicts the object of which it is an image, while he is admittedly unwilling to grant that there is anything that can be materially seen in seeing something in the mind's eye. This incoherence is clear once we read his remark: 'What is in question is the *image* of a star in the sense that it *depicts* a star' (mind the 'it'). Here the referent of 'it' appears to be a representative entity which depicts the object represented. It, thus, seems to follow that Dilman's account of seeing in the mind's eye becomes too close to seeing the person in a portrait, or what we have called 'representational seeing'. For it now seems as though the imager is intentionally seeing Y (the actual star) in X (the image of the star). But, then, how does this X stand in relation to the imager? Surely, Dilman would get into much trouble if he conceded it to be a relation of material seeing. Yet, the image is there in its own right for him to account for. Does this imminent trouble hint that seeing in the mind's eye should not be modelled on representational seeing? Is seeing in the mind's eye intentional seeing, pure and simple?

Hidé Ishiguro suggests that the right approach to the nature of mental imagery lies in our considering what it would be like to have the experience of representational seeing *minus* its material seeing (or causal) component (Ishiguro, 1967). According to her, the schema for mental picturing has to be different from that for drawing a picture on a canvas or taking a picture of something (i.e., photograph). While 'seeing X as Y' is an appropriate schema for seeing the object pictured (Y) in the photograph or painted canvas (X), it cannot accurately schematize the phenomenon of mental pictures; because there is no independently identifiable X, no mental or private entity, which stands in a representational relation to Y in the way the extensionally identi-

fiable photograph stands to the object photographed. Hence the schema for 'seeing in the mind's eye' has to be a truncated one. Ishiguro writes: 'The representations we have considered up to now were described by the expression: "X's seen as Y's". In the case of mental images the X's disappear, as it were, and we are just left with the activities of 'seeing as Y'" (Ishiguro, 1967, 50).

Apprehending that the cryptic remark 'seeing as Y' might appear to be a verbal trick, Ishiguro provides an example to demonstrate the phenomenal proximity of mental imagery to 'seeing as'. Suppose, I see a photograph of a man, and, as I keep looking at it, the photograph gradually fades away. Yet, I am able to see the man even in the remaining traces of the photograph. It seems that I must in some way mentally make up the vanishing features of the photograph, so that I do not see a vanishing man as well. And, at the end-point of this process when I am left with nothing to see *as*, I shall have completed my mental making-up of the man, that is, the image of the man. It then seems that, throughout the entire process of first seeing the man in the photograph and then seeing him without the photograph, something remains unchanged. The unchanging fact is that I intentionally see the man when I materially see the photograph as well as when subsequently the photograph disappears from my perceptual purview.

Ishiguro's analysis indicates that mental imaging is non-representational intentional seeing or a kind of 'direct' intentional seeing. However, her new schema of 'seeing as Y' still retains the core concept of representational seeing, namely, 'seeing as'; and 'seeing as' has no meaning unless it means seeing one thing as another. Hence 'seeing...as Y' is an essentially incomplete schema which can be rendered meaningful only when the blank is filled with another expression. For what can seeing-as-*Y* mean if there is no *X* to see *as*? Surely, it would be absurd to say that seeing *Y* in the mind's eye actually means 'seeing *as* Y in the mind's eye'. Indeed, Ishiguro herself would concede that nothing is seen *as Y* when *Y* is seen in the mind's eye. Should we, therefore, discard the analogy of *seeing as* altogether?

Perhaps the analogy of representational seeing is useful as a heuristic device. What the vanishing photograph example shows is the very important point that intentional seeing can stand on its own even when material seeing ceases to accompany it due to artificial or natural reason. Intentional seeing then becomes non-representational seeing; but we come to realize the non-representational structure of mental imaging by analogical reference to the representational structure of 'seeing as'. And the attenuation of 'seeing X as Y' to 'seeing as Y' should not be mistaken as yielding a new schema for mental imagery. Rather, it should be taken as leading us to the discovery that imaging is not a species of 'seeing as'. Therefore, like Wittgenstein's Tractatarian ladder, we should throw away the schema of 'seeing X as Y' after having used it to find out that seeing in the mind's eye is not representational seeing.

If mental imaging is intentional seeing *simpliciter*, then it would appear to be something akin to thought or intelligence. Is it characterizable as exclusively a matter of intellect or thought, as purely a function of intelligence? Ryle, the precursor of the perceptual-thought theory, has no qualms about describing images solely as a function of hypothetically utilizing perceptual know-hows, as we have already said earlier. Seeing Helvellyn in the mind's eye is, for Ryle, seeming to see Helvellyn, that is, fancying that one sees it. This fancying, which we described earlier as 'hypothetically R-apprehending S', is a hypothetical utilization of the appropriate 'perception-recipe' acquired in a prior perceptual acquaintance with Helvellyn. It consists in thinking how Helvellyn would look, and thus intelligently modelling oneself as the person with a behavioural disposition characteristically attributable to someone actually perceiving Helvellyn. In Ryle's own words:

> Seeing Helvellyn in one's mind's eye does not entail, what seeing Helvellyn and seeing snapshots of Helvellyn entail the having of visual sensation. It does involve the thought of having a view of Helvellyn and it is therefore a more sophisticated operation than that of having a view of Helvellyn. It is one utilization among others of the knowledge of how Helvellyn should look, or, in one sense of the verb, it is thinking how it should look. The expectations which are fulfilled in the recognition at sight of Helvellyn are not indeed fulfilled in picturing it, but the picturing of it is something like a rehearsal of getting them fulfilled. So far from picturing involving the having of faint sensations, or wraiths of sensations, it involves missing just what one would be due to get, if one were seeing the mountain (Ryle, 1949, 255).

If seeing Helvellyn in the mind's eye consists in an intellectual rehearsal of getting a view of the mountain, then having a mental image of Helvellyn would seem to be devoid of any phenomenological content at all. Rather, its content would be the content of the description of how Helvellyn appears. But such a descriptional account of mental imagery seems wrong, precisely because images do seem to have some phenomenological content which cannot be reduced to some 'abstract' content of certain propositions about how the object appears.

Besides, as it has rightly been pointed out by Ishiguro in an earlier paper, imaging is not a pure *doing* or performance but a *happening* as well (Ishiguro, 1966, 153-78). I may know that the parrot in my house has greenish wings and a pinkish beak; I may then try to form an image of the parrot and yet fail to have any. Since this failure is possible, even though I am able to give a description of the parrot when asked to do so, imaging cannot be identified with describing, albeit it is true that, if I do succeed in having the image, it would be identified under that description. Hence the ability to give a description of the parrot's look is one thing, and being able to form an image

of the parrot, which is identified under that description, is quite another thing.

If having an image is a matter both of doing and achieving, then imaging is not entirely a function of intelligence or 'knowing how'. My knowledge of how the object looks is a skill that I may try to utilize in a hypothetical frame of mind, intending to visualize the object; yet my attempt may turn out to be abortive. But, when my attempt does produce the intended result, something is said to 'happen' in me, and I am somehow *aware* of this happening. I 'get' the image I intended to have. Now, if my being lucky to get the image is not guaranteed by the function of my intelligence or 'knowing how' capacities, what else within me can be held responsible for my success? Am I also not being 'sensitive'—in some special sense of the term—to getting the image 'before' my mind's eye?

Conclusion: Towards an Intermediation between Rival Theories

In discussing the perceptual-thought theory I have argued that, in its overzealous concern for assimilating mental imaging to thinking, this theory fails to do justice to the phenomenological content of images. And in dealing with the perceptual-sensation theory I have maintained that, in its obsessive concern for 'perceptualizing' mental images, it undermines the intentionality or thought-dependence of images. Thus, the unsatisfactory polarity of these two theories appears to be a signal of distress, as it were, appealing for some sort of compromise which can ensure that the ensuing theory preserves the phenomenology as well as intentionality of mental imagery. Such a theory would not render images experientially vacuous, as Ryle does; nor would it 'sensualize' the experiential process, as Haynes does.

The foregoing examination has brought out the fact that, though mental imaging is a mode of thinking, there is more to the content of an image than that of a description or proposition. For there seems to be some concrete experiential content to having an image, which is why the thought-process of imaging carries more than just the propositional content of a description. However, the experiential content of an image cannot be said to be sensuous in the full-blooded sense of the term, because the image is not a result of sensory intake (although past sensory intake is necessary for the possibility of having images). In other words, imaging cannot be held to be a straightforward function of sentience in that the image is not had through the operation of sensory receptors receiving external stimulus. This is why 'intentional seeing' (contrasted with 'seeing proper' in the sense of having a full-blooded visual experience caused by the appropriate object) is an apt phrase for 'seeing in the mind's eye'.

Nevertheless, this experience of intentional seeing cannot but be described or reported in the language of perceptual experience. So one cannot be faulted for saying that having an image is having a quasi-sensuous or quasi-perceptual experience (despite the vagueness of all quasi-talk). It is the peculiar phenomenology of imaging experience which compels as well as legitimizes our having recourse to perception-language. Otherwise, there would be no way of distinguishing the thought-process of imaging from that of abstract or purely conceptual contemplation.

Facts of experience support the above line of thinking. We often fail to visualize a familiar face clearly, and end up having a blurred image of the face. But surely the blurred image of the face is not an image of a blurred face. The blur does not represent anything in the face visualized, nor does it mean that the mental representation of the face is blurred (because there is no such mental object with a physical property). Further, 'blurred image of the face' cannot mean 'vague description of the face', because it is a familiar face and can, therefore, be described clearly. Thus considered, the blur has to be a feature of the 'imaging awareness' itself, that is, a particular manner in which the face is intentionally seen. But this does not imply that the awareness itself is vague or blurred in the way the outlines of a tree appear blurred in a foggy environment. (Experiences do not have outlines.) What is being laboured to get across here is the point that mental imaging is very much like viewing perceptually, and, therefore, having a blurred visual image is very much like having a blurred perceptual view, e.g. seeing a man in a foggy environment.

Another crucial point is that, although having a visual mental image of X entails thinking of X, it is not thinking what X as an object of seeing is like but thinking *what it is like* to have a visual experience of X. While the former variety of thinking need not entail anything more than having descriptive knowledge of the features observable in X, the latter kind of thinking entails imagining having the visual experience or sensation of X. In other words, mental imaging is not a case of thinking propositionally but of thinking experientially; and that is why describing the image in terms of a sensory experience is appropriate as well as inevitable, even though it may be impossible to indicate in *what* way the image is 'like' a particular sensory experience.

It is in the notion of experiential thinking that we discern a need to invoke the idea of sentience. For if mental images are not experientially vacuous, the quasi-sensuous experiential content attached to the mental process of imaging has to be 'credited' to sentience or at least near-sentience. The imager has to be recognized as having a sentient or 'sensitive' aspect as much as he is bestowed with the intelligence of modelling himself as a perceiver. For it makes sense to say that, when his attempt to conjure up some image does not succeed, he is not 'sensitive' to having the image. His sensitive side does not respond as it were: it is a failure of sentience in this instance. Similarly, when the sensitive side does respond and the image occurs, it becomes an instance of the 'favour' of his sentience.

I have deliberately extended the scope of sentience to include, not just its responsiveness or receptivity to sensations, but also its receptivity to sensa-

tion-like states, or states resembling the phenomenal qualities of sense -perceptual experience. This extension derives its justification from the fact that mere intellect or intelligence (i.e., the thought-aspect alone) cannot explain the occurrence of quasi-perceptual states or events. And, mental images being such phenomena, their accountability requires us to refer beyond mere thought or intellect. There is more to their psychological reality than what can be yielded by the unaided operation of mere thought. Of course, it is not implied here that the role of sentience comes into operation in the way it does in perception. What is implied is, as mentioned earlier, only the 'favour' of sentience in the sense that the thought-process involved in imaging is somehow able to reactivate the sensory potential, which gets naturally activated in a perceptual process. Metaphorically speaking, the image emerges only when the finger of thought touches the right cord of sentience. (This metaphor is specially apt for auditory images.)

The upshot of the overall discussion in this paper is that the phenomenon of mental imagery should not be viewed exclusively either as a function of sentience or of pure thought. It is of this unhappy polarization on the part of two rival theories that this paper has been a critique. My attempt here has been to demonstrate that mental images are as much phenomenal as they are intentional. The thought that constitutes the intentionality of an image is also pregnant with certain phenomenal qualities resembling those of perceptual experience; and the presence of this 'qualitative' aspect constitutes the phenomenology of the image. If this is the right picture of mental imagery, then the heuristic picture should be drawn as an axis, with sentience and thought placed at its two ends but both tending towards a point of convergence, as it were, somewhere in the middle of the axis. Now imagine that the natural place for mental images is this indeterminate region specified by the middle of the axis, partaking both of sentience and thought. No doubt, mental images are like half-way houses.

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Search for Indian traditional paradigm of society*

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1

In 1955, Professor D.P. Mukerji in his presidential address to the First Indian Sociological Conference asserted that the traditional Indian thought categories were *puruṣa* and group rather than the individual and society (Mukerji 1958, 228-41). On this basis he found serious flaws in both the Western sociological and Marxian perspectives for the study of Indian society. However, he added that in the educated middle class of India the concept of the individual was gradually replacing the concept of *puruṣa*. He also suggested that for an understanding of Hindu classical tradition it was necessary to study Sanskrit. It is unfortunate that these seminal ideas of D.P. have all along been missed by Indian sociologists.

It is an interesting coincidence that in the same year Professor Louis Dumont asserted that 'a Sociology of India must lie at the point of confluence of Indology and sociology' (Dumont and Pocock 1957, 7). Since then a number of scholars of Indian sociology has employed the perspective and methodology developed by Dumont. They have also been emphasizing the study of Sanskrit texts for identifying the traditional values which inform contemporary factual contexts. They have been attempting to understand Indian civilization within the structuralist framework, along with the unavoidable Western thought categories of individual and society, which, according to D.P. Mukerji, are not the traditional Indian thought categories. However, these scholars juxtapose the insiders' and outsiders' views of Indian civilization.

I am not an outsider to Indian tradition despite my exposure to Western thought categories, theories and methodologies. I do not even pretend to look at Indian tradition as an outsider in order to join the slowly growing number of such Indianists, both Indian and foreign. Nor do I claim to have studied even all the major texts which may illuminate me in my attempt to formulate the traditional paradigm of Indian society[1] However, I do claim

*This paper was specially written on the occassion of the Silver Jubilee of the Department of sociology of Jodhpur University. According to the author, the formulations in it are 'at best tentative'. In publishing the paper, we invite comments and observations from our readers at which the author primarily aims, and which, in addition to giving 'final shape to the ideas' presented herein, may throw interesting light on an important aspect of Indian traditional thought system.—EDITOR

to have grown in Indian tradition. On this basis as well as on the basis of my studies of Sanskrit texts in original I feel convinced that some vital elements of Indian tradition are being missed, and they cannot be identified with the technique of delineating the insiders' views in terms of outsiders' thought categories.

The inside view of Indian tradition has to be ascertained in terms of insiders' vision and thought categories. For me Professor D.P. Mukerji's presidential address of 1955 has provided the clue to understand Indian tradition in terms of insiders' vision. In my discussion note entitled 'Puruṣārtha in Indian Texts' published in *Contributions to Indian Sociology* (Sharma. 1986, n.s. 20, 2), I presented some of my ideas on Indian tradition, *puruṣa* and society briefly. In this paper, I pick up the threads from that discussion note.

Puruṣa. Usually the word *puruṣa* is translated as 'man', while in philosophical discourses it is understood to mean 'the one who sleeps in the town.' This meaning emanates from Nirukta and Śaṅkarāchārya's etymological explanation of *puruṣa* (*puri śete*). In this sense the consciousness which is omnipresent in the cosmos and which also resides in all beings is *puruṣa.* It is inactive, and is only a witness to the activities carried out by the *prakṛti* (nature or materiality according to Larson). Of course, in Śaṅkarāchārya's *advaita* (non-dualistic) philosophy *prakṛti* is not recognized.

The sāṅkhya philosophy recognizes both *puruṣa* and *prakṛti.* However, its recognition of *puruṣa bāhulya* (plurality of *puruṣa*) indicates that it is talking of *jīvātmā* and not the omnipresent *puruṣa* of the *Puruṣa Sūkta.* For the latter asserts that *'puruṣa evedam sarvam' (puruṣa*, indeed, in this all). As the Sāṅkhya philosophy is *aviruddha* (not opposed) to the vedic tradition, I treat the omnipresent consciousness as *nirupādhi puruṣa* (without the disguise of name and form), while the *puruṣa* as jīvātmā (in the Sāṅkhya tradition) as *sopādhi puruṣa* (with the disguise of name and form).

Consequently, I suggested that for *sopādhi puruṣa* (I did not use the adjective *sopādhi* in my discussion note) the meaning of *puruṣa* has to be *purati agre gacchati* (one who moves forward). In the forward movement there is activity. The direction of forward movement is well defined. It is to identify *prakṛti* and its role, and thereby to free oneself from the control of *prakṛti.* In other words, the forward march is from *sopādhi puruṣa* to *nirupādhi puruṣa.* In a metaphysical sense, this is not a movement but only shedding one's ignorance born out of *prakṛti* in order to realize oneself. This freedom from *prakṛti* is visualized as *mokṣa.*

But most men, in fact, are not oriented to *mokṣa.* It appears to me that this fact is embedded in the etymology and usage of the words *nara* and *manuṣya*

The word *nara* means the one who carries the consequences of one's good and bad actions, *puṇya* (meritorious action) and *pāpa* (sinful actions) forward

in this life as well as in future life. Such a man is not oriented to *mokṣa.* He is bound to the cycle of birth and death. His highest achievement could be going to *swarga* (heaven) for a specified period limited by the amount of *puṇya* he has earned in this life as well as in past lives.

The words *manuṣya* and *mānava* refer to the biological entity called man. He may not be oriented towards *mokṣa* and may not be conscious of the distinction between *puṇya* and *pāpa* and their consequences. Thus, he may act only for the pleasures of the body or satisfaction of his *ahaṁkāra*[2] (egotism). At this biological level, the man shares many similarities with other animals. It may not be out of place to mention that the socio-biological theories in anthropology and sociology are rooted in this concept of man.

The distinction between *puruṣa, nara* and *manuṣya* is indirectly supported by the fact that, although the Sanskrit dictionaries treat *puruṣa, nara, manuṣya* and *mānava* as synonyms, not a single text uses the word *narārtha* or *mānavārtha* in place of *puruṣārtha.* In my understanding these three synonymous words refer to three different kinds of consciousness, according to which human beings may be classified. They also signify three levels of evolution of human consciousness from biological to moral and ultimately amoral or spiritual. It is possible to visualize that a man may oscillate between *manuṣya* and *puruṣa* or may gradually change himself from *manuṣya* to *puruṣa* or suddenly adopt a totally different orientation, or may act throughout his life according to one of the three types. The objective of *dharma* is to transform a man atleast from *manuṣya* to *nara*, so that he can discern between meritorious actions (*puṇya*) and sins (*pāpa*), and possibly rise above the binary oppositions of morality and immorality, *dharma* and *adharma*, etc. and achieve *mokṣa.*

Finally, I may point out why the word *puruṣa* refers to only man and not to other beings. The reason seems to be that *manuṣya yoṇi* (the human life form) is the only life form which is conceived as both *bhoga yoṇi* (the life form in which one experiences the consequences of one's actions) as well as *karma yoṇi* (the life form in which one can initiate actions for self-realization through *jñāna* and can thus acquire the state of the *nirupādhi puruṣa.* This seems to me the central theory of man in the Indian tradition.

Society. There is no concept in Indian tradition which is equivalent to the sociological concept(s) of society.[3] Probably that is why Professor D.P. Mukerji insisted that in India the man had been living in groups. The word *samāja* usually held as the Sanskrit/Hindi equivalent of the word society, refers to groups as well as any temporary collectivity of human beings. For example, the *Siddhānta Kaumudi* (a text of Sanskrit grammar), while explaining the meaning of *samāja*, gives the example of the *samāja* of Brāhmaṇas (*samājo Brāhmaṇānām*) i.e. group or collectivity of Brāhmaṇas. The word, which may come closer to the notion of society only in terms of extensiveness, is *loka.* However, it implies a number of things, which cannot be

embedded in the word 'society'. Etymologically, the word *loka* means the place where one experiences the consequences of one's actions (*lokyate bhujyate karma-phalam yatra*). Derivatively, it means not only the place but also the beings who enjoy or suffer the consequences of their actions. The beings include not only men but all life forms, because they are all perceived as *bhoga yoṇi* as pointed out earlier.

For the integration and maintenance of society one may use the word *loka saṁgraha*. But it also implies integration and maintenance of the collectivity of peoples as well as of all life forms and their interdependence as well as a system by which human beings are induced to grow from *manuṣya* to *nara* to *puruṣa*, so that ultimately they realize their self and shed their upādhi.

Besides, it may also be pointed out that there is no conception of society between the *nirupādhi puruṣa* and the *sopādhi puruṣa* exercising social control over individuals. The function of social control is assigned to the state which is conceived to exist between the two kinds of *puruṣa* as an agency of social control in particular and for *lokasaṁgraha* in general. The *rājanya* presiding over the state is supposed to act for the maintenance of the cosmic order (ṛta). In this sense, the state is nothing else but an agency or an arm of the *nirupādhi puruṣa* or cosmic reality for maintaining the cosmic order. In case the *rājanya* acts with self-interest in mind and/or against the ṛta (the cosmic order), he is not treated as a *rājanya* but as a *kṣhatriyabandhu* (etymologically *kṣhatriya-kin*, but is used pejoratively).

What we sociologists call social phenomenon may be conceived in this perspective as a product of actions (*karma*) and transactions (*vyavahāra*)[4] between the three categories of human beings—*puruṣa, nara* and *manuṣya* or, in the words of the *Gītā*, three categories of actors—*sāttvika, rājasa* and *tāmasa*. The *sāttvika* actor is the one 'who is free from attachment, who has no speech of egotism, full of resolution and zeal and who is unmoved by success or failure'. The *rājasa* actor is the one 'who is swayed by passion, who eagerly seeks the fruits of his works, who is greedy, of harmful nature, impure and who is moved by joy and sorrow'. The *tāmasa* actor 'is unbalanced, vulgar, obstinate, deceitful, malicious, indolent, despondent and procrastinating' (*Gītā*, 18: 26-27-28).

These three kinds of actors have many similarities with the conceptions of *puruṣa, nara* and *manuṣya*, respectively. The *rājasa* and *tāmasa* actors are usually preponderant in all societies and ages except in *satya yuga*.[5] They may also be conceived to be acting as individuals with separate identities in the pursuit of their self-interests.

Before I take up the principles which underlie not only the conception of man, but also the schemes of *puruṣārtha, varṇa* and *āśrama*, let me explain my understanding of the Sanskrit words used for tradition.

Āmnāya and Paramparā. In Indian thought there are two words used for tradition. They are *āmnāya* and *paramparā. Āmnāya* is translated as sacred tradition, while *paramparā* may be translated simply as tradition. Sacredness in *āmnāya* implies its unchanging atemporal character. *Paramparā* is the continuity of the sacred tradition through space and time. The sacred tradition (*āmnāya*) is atemporal, and, therefore, its principles have validity through all space and all time. *Paramparā* derives its legitimacy from *āmnāya*, but it may change through time and space. However, so long as it does not contradict the principles of *āmnāya*, it remains legitimate.

Etymologically, the word *āmnāya* means 'that which is repeated'. As the Vedic *mantras* were repeated for remembrance, the word refers to the Vedas and derivatively to the tradition flowing from them. However, when one intends to identify the atemporal tradition in the Vedas, enormous difficulties arise. For example, the emphasis in the Vedas on *karmakāṇda* (rituals) in general which is specially connected with the performance of *yajñas*, is criticized and sometimes even condemned by Upaniṣads in particular and by the followers of *jñanakāṇda* (path of knowledge) in general. Both derive their legitimacy from the Vedas. How can such mutually contradictory thoughts and practices be atemporal? Besides, the Vedas contain prayers for the destruction of enemies, and similar mundane concerns of man. How can such ideas be treated as part of the atemporal tradition? These questions have been arising in my mind since I read Professor A.K. Saran's reference to *āmnāya* in *Dinamāna*, a Hindi magazine, in 1982.

According to my understanding, the only atemporal and eternal or imperishable (*nitya*) entity is *nirupādhi puruṣa*, or Brahma in terms of Advait philosophy. The *nirupādhi puruṣa* or Brahma as well as the *moolā prakṛti* or *pradhāna* in Sāṅkhya philosophy are not manifested. The human beings and the social phenomena which they generate are part of the manifested *prakṛti* or *jagat* ('moving' phenomenal world), and are temporal and changing (*anitya*). These temporal entities are manifestations of the unmanifested, because they have been generated out of it. However, the interrelationship between the unmanifested and the manifested is atemporal. Therefore, the principles which underlie the relationship between them may be treated as the *āmnāyika* principles. Impliedly, these principles have to be embedded in *puruṣārtha, varṇa, āśrama*, etc. *Paramparā* may modify their practices but cannot undermine these principles, if it has to maintain its legitimacy in terms of the *āmnāya*.

For our purpose it is not necessary to examine the similarities and differences between the conceptions of various Indian philosophical schools about the relationship between the unmanifested absolute reality and the manifested 'moving' phenomenal world (*jagat*) and the phenomenal ego (*jīva*). Moreover, it is not possible to discuss these principles in detail in this paper.

II

The Āmnāyika Principles

In the Indian āmnāyika tradition the phenomenal changing reality, including social phenomenon, is a part of the unchanging unmanifested *puruṣa*. *Puruṣa evedam sarvam* (the *puruṣa*, indeed, is this all), so says the second *mantra* of *Puruṣasūkta* of Ṛgveda. If social reality is a part of the cosmic reality, what is the relationship between the whole and its parts? It can be described through two essentially converging perspectives. The first perspective may be termed as the *nirupādhi* perspective which looks at the parts from the vantage point of the whole, i.e. the *nirupādhi puruṣa*. It is provided by *Iśāvāsyopaniṣad*.

Om Pūrṇamadah pūrṇamidam,
pūrṇātpūrṇamudachyate;
pūrṇasya pūrṇamādāya
pūrṇamevāvaśiṣyate.

It means that "*nirupādhi puruṣa* or Brahma is *pūrṇa*[6] (pervasive and continuous like ākāśa), while this entity (*sopādhi puruṣa*) qualified by *nāma* and *rūpa* (name and form) and involved in *vyavahāra* (transactions) is also pervasive and continuous. How? For this *sopādhi puruṣa* is caused by the pervasive and continuous *nirupādhi puruṣa*, and the latter cannot discard its pervasiveness and continuity by acquiring an appearance or name and form. When the *upādhi* of name and form are taken away, what remains is the pervasive and continuous *nirupādhi puruṣa*" (Bhagwan, 1910, 1). The usual example given in Sanskrit texts to explain this relationship is that of gold and any ornament made of gold. An ornament acquires a name and a form. When the appearance of ornament or its name and form are taken away, what remains is gold.

The second perspective, for want of a better term may be called the *sopādhi* perspective. It looks at the relationship between the whole and its parts from the vantage point of the parts, or *sopādhi puruṣa*. These principles explaining the relationship are stated in various forms like the relationship between *kṣara* and *akṣara*, *vyaya* and *avyaya*, *vyakta* and *avyakta* and *vibhakta* and *avibhakta*. I take up the last two for my purpose; the first two are implied in them.

It appears to me that two principles underlie the perception of relationship between the *vyakta* (manifested) and *avyakta* (unmanifested). The first principle is a logical one. In accordance with it, the *vyakta* is the effect of the *avyakta*. However, the *avyakta* as the cause is not treated as lying entirely outside the effect. The part of the cause which lies outside the effect is called *nimitta kāraṇa* (efficient cause), and the cause which lies inside the effect is called *upādāna kāraṇa* (material cause). As the *puruṣa* in its totality is never

fully manifested, one may conceive of two kinds of *puruṣa*, the *vyakta* and *avyakta*. The *avyakta puruṣa* or the *nirupādhi puruṣa* transcending or rising above (*ūrdham udatiṣthan*) the *vyakta* is *nimitta kāraṇa* of the phenomenal reality, while the *puruṣa* which underlies the *vyakta upādhi* or which is immanent in the manifested disguise is *upādāna kāraṇa*. Therefore, one cannot understand the *vyakta* without the context of the *avyakta*. The two are continuous. For example, one cannot understand the form and kind of a tree without reference to its seed which lies hidden and carries the code of the tree in the genes.

The second principle is that the state of the *vyakta* (manifested) is transitory. It was *avyakta* (unmanifested) before its manifestation and will again lose its identity in the *avyakta*. For example, a human form emerges from the unmanifested, and will lose its identity after death in the unmanifested.

The next important principle is based on the relationship between *avibhakta* (unseparated) and *vibhakta* (separated). All manifested forms of life are *vibhakta* (separated) in terms of name and form. Therefore, they have separate manifested identity. However, they are all one because of the presence of *puruṣa* in all of them. Besides, the manifested is a part of the unmanifested. Therefore, all manifested entities appearing to be separate are essentially *avibhakta* (unseparated).

The process of transformation from *avyakta* to *vyakta* and back to *avyakta* and similarly from *avibhakta* to *vibhakta* and back to *avibhakta* is conceived as cyclical rather than linear. In fact, the whole process of creativity as well as time and space are conceived as cyclical (cakrīya). But one may ask, how does a part of the unchanging unmanifested reality manifest itself? The answer to this question is provided by the symbols of *ṛta* (cosmic order) and *yajña* (sacrifice) and the law of *karma* (action).

The symbol of *yajña* (sacrifice) is crucial to an understanding of the transition from the *avyakta* to *vyakta*. Though it is, like many Indian symbols, credited with varying conceptions, it essentially means an action which is efficient in creating the intended object. It provides the internal dynamism to the structure of cosmic reality which reposes on itself. The sacrifice is the act which makes and preserves the universe. It is the ultimate principle of cosmic reality. In this perspective there is constant change in the universe, including in what we call society. However, its path is unpredictable. It will all depend on the sacrifice, and on the manner the creative act is going to occur. This is the realm of true freedom, but it involves also the risk of misuse (Panikkar, 1983, 348-49).

The symbol of sacrifice is closely associated with the symbol of *ṛta* (cosmic order). According to Panikkar,' *ṛta*' stands for the non-ontological but nevertheless real principle of order and of activity. *Ṛta* is the very energy of the sacrifice, it is what triggers the sacrifice (Panikkar, 1983, 350). Panikkar further holds:

> ...[the] cosmic order is not a fixed physical or mathematical law but a sacrificial order'...It is the expression of the primordial dynamism that is inherent in everything and also possesses its own internal coherence, a unifying force that could be said to be the very soul of sacrifice.
> The moment that ṛta is converted into a concept and is given a consistency in itself it is bound to appear as something rigid, immutable; a fixed cosmic order like a mathematical law which does not tolerate exceptions...(Panikkar, 350-51).

Actually it denotes flexible adaptation. In this sense, chaos or disturbances in the cosmic order and also their elimination are part of the cosmic order itself.

As the social phenomenon is conceived as a part of the cosmic reality, it should also be maintained by the cosmic order and sacrifice, i.e., *ṛta* and *yajña*. *Dharma* is conceived as the human version of *ṛta* for the maintenance as well as transformation of social reality. Man, being a part of the cosmic reality, has to participate in the yajña (sacrifice). He can do so by sacrificing himself or his separate (individual) identity, according to a later interpretation of yajña.

In the context of human beings, the relationships between the *vyakta* and the *avyakta*, and the *vibhakta* and *avibhakta*, etc. may be further explained through the relationship between *śarīra* (body) and *ātmā* (soul), between *deha* (body) and *dehi* (the one who has the body) or between *ratha* (chariot) and *rathi* (charioteer). The *śarīra* represents the *vyakta*, (manifested) and *vibhakta* (separated), and, therefore, it is *anitya* (transitory). The *ātmā* is *avyakta* (unmanifested) and *avibhakta* (unseparated) from other *ātmās* which are associated with the manifested forms and the *paramātmā* (supreme soul) which is also unmanifested.

Átmā and *śarīra* are *vibhakta* as well as *avibhakta*. The *śarīra* is perishable and, therefore, transitory, while *ātmā* is not perishable; it is eternal. Therefore, the two are separate. However, once *ātmā* is associated with *śarīra* or once *ātmā* becomes *sopādhika*, its movement is influenced by the actions of *śarīra* and its organs, just as the movement of a charioteer (*rathī*) are influenced by the movement of the chariot driven by horses. If the charioteer can control the horses and, therefore, the chariot, he can go wherever he wants to; but, if he cannot control them, he will go where the horses and the chariot take him. In this sense, the two are interdependent.

It is held in the Indian tradition that, when *ātmā* moves out of a *śarīra* after its death, it carries with it a *linga-śarīra* (symbolic body). The *linga-śarīra* carries the coded programme of actions (*karma*) and consequences of the actions performed through the body which has just perished. In the next life the *linga-śarīra* expresses itself through the *svabhāva* (innate disposition of the individual being and *guṇa* (modes of expression of *svabhāva*). It is held that it is *svabhāva* which operates (*svabhāvastu pravartate*) in the *karma*

(actions) of a being. This is part of the doctrine of *karma* which need not be explained here in detail. But it is necessary to point out that in this perspective the manifested human actions, which sociologists claim to study and understand, cannot be explained without reference to the *avyakta svabhāva* and *guṇa* rooted in yet another *avyakta*, i.e., the *karma* of previous life or lives.

III

The Basic Human Goals and Social Institutions in the Traditional Perspective

Elsewhere (Sharma 1975, 1986a and b) I have dealt with, albeit briefly, *puruṣārtha*, *varṇa* and *āśrama* in *āmnāyika* perspective and their interrelationships. Even here their detailed examination will cross the limits of this paper.

Puruṣārtha. The essential meaning of the word *puruṣārtha* is embedded in the meaning of the word *puruṣa* or rather *sopādhi puruṣa* itself. The forward movement of the *sopādhi puruṣa* as has been explained earlier is to realize oneself and thereby to become one with the *nirupādhi puruṣa*. The only things which separate him from the *nirupādhi puruṣa* are his *upādhi* (name and form) and his *vyavahāra* (transactions) born out of his *upādhi*. Once a *sopādhi puruṣa* succeeds in realizing that the *upādhi* is a product of *prakṛti* (in the sense of Sāṅkhya philosophy) and is transitory (*anitya*) and that essentially he is not *upādhi* or name and form, the wall of separation between him and the state of *nirupādhi puruṣa* is eliminated. This is the goal of *puruṣa* and the highest goal for *nara*. It is called *mokṣa*, i.e., the release from the bonds of prakṛti. It may be achieved in one life or may be achieved in several lives through gradual realization and accumulation of *jñāna* (knowledge) and carrying it forward from one life to another life.

So long as a man considers himself a separate entity and acts in accordance with the urges of the body and its external instruments or organs and the internal instrument of *ahaṁkāra* (egotism or conception of one's individuality), he is acting as *nara*. His transactions with others are based on mutual expectations, and internal sources of propulsion. He also expects certain fruits of his actions. Therefore, he will carry forward the fruits of his actions not only in this life but also in the future lives. This carrying forward of the fruits of one's actions is involved in the meaning of the word *nara* as pointed out earlier.

All pursuits of *nara* are covered under the *puruṣārthas* of *artha* and *kāma*. The role of *dharma* is to guide a *nara* in these pursuits, so that the consequences of his actions do not cause suffering or ultimately do not lead him

to *naraka* (hell) in *paraloka* (the world beyond this life). The higher order role of *dharma* is to help a man in realizing the transitory nature of *artha* and *kāma* and their being causes of suffering and thereby in crossing the barrier of the orbit of *nara* and the fruits of his actions, so that he moves forward like *puruṣa* to realize himself.

Once he rises above the bonds of *artha* and *kāma*, there is no necessity of *dharma*. This is implied in the statement of the *Gītā* (18.66) that 'abandoning all *dharma*, seek shelter in me'. Lord Buddha was most unequivocal when he said that *dhamma* is like a ship. Once a person crosses the ocean and reaches the other shore, he should abandon *dhamma*, because it is not required any more.

Puruṣārtha provides both descriptive and prescriptive schemes of goals of human beings. *Artha* and *kāma* are goals of all normal human beings, because as *manuṣya* they consider their biological being as themselves. Therefore, everybody seeks to serve his self-interests rooted in the *bāhyakaraṇa* (external instruments), i.e., the organs, and the body, besides the *antaḥkaraṇa* (the internal instruments), e.g. *ahaṁkāra* (conception of one's individuality).

The prescriptive scheme of goals hedges these two goals with *dharma* on one hand and *mokṣa* on the other. These headgings derive their legitimacy from *āmnāya* in which man is considered to be the manifestation of the cosmic reality with a name and a form. He is separated from the cosmic reality through the process of creativity, but essentially the two are treated as one, as is implied by the use of the word *puruṣa* for both. As the acts of man, who is a part of the cosmic reality, weave out social phenomena, the latter are part of the cosmic reality; and, as *ṛta* (cosmic order) maintains the cosmic reality, its human counterpart *dharma* has to maintain the social reality through the directions for the pursuits of *artha* and *kāma*.

Finally, the separation of man, *sopādhi puruṣa*, from the cosmic reality (the *nirupādhi puruṣa*) is transitory: it is followed by the shedding of the causes of separateness at the end of any cycle of creation. Therefore, it is incumbent on man to accomplish it consciously so that he achieves *ātyantika dukḥ nivṛtti* (the ultimate elimination of sorrow). Though the pursuit of *artha* and *kāma* may also be perceived as efforts for the elimination of sorrow, they are viewed as causes for the generation of sorrow also. In this sense *puruṣārtha* is considered as a *samuccaya* (integrated whole).

The view that the four *puruṣārthas* encompass the *trivarga* (*dharma*, *artha*, and *kāma*) overlooks the fact that the pursuit of *trivarga* was emphasized by the ritualistic (karmakāṇḍa) school of thought, and that it was, in fact, corrected by jñānakāṇḍa school of thought led by the Upaniṣads on the basis of *āmnāya* by underlining *mokṣa* as the ultimate goal of life and integrating all others with it.

Āśrama. *Āśrama* system presents a design for the pursuit of *puruṣārthas*. In *brahmacarya* one pursues the goal of *dharma* by acquiring the right vision with which one can 'walk with *Brahma*' or can ultimately realize oneself.

Artha and *kāma* are to be pursued in *gārhasthya* with the vision provided by *dharma* in *brahmacarya* and under the guidance of the specific *dharma* of *gārhasthya*. *Dharma* helps a householder in realizing that the pursuit of *artha* and *kāma* does not help in removing the causes of his suffering; and thus prepares him psychologically to renounce the pursuits of *artha* and *kāma* and the associated *dharma*, and gradually to become a *sannyāsī* through the stage of *vāṇaprasthya* (forest-dwelling). This scheme of life was meant only for one who had acquired the vision of the relationship between the cosmic reality and the phenomenal reality through the study of the Vedas in *brahmacārya*. This is what is meant by the statement *sannyāse viprasyaivādhikāraḥ* [only a *vipra* (who has studied the Vedas) is entitled to be a *sannyasi*]. The word *vipra* is treated as synonym of Brāhmaṇa. But the two are not equivalent in their etymological meaning and early usage. This leads me to a brief discussion of *varṇa vyavasthā*.

Varṇa. *Varṇa* is essentially a classification of human beings based on their orientation born of their *svabhāva* (innate dispositions) dependent on a specific combination of *triguṇa*. The roots of *svabhāva* lie in the totality of one's actions of previous life. As they are *avyakta* (unmanifested), they cannot be traced empirically. As one's *svabhāva* emerges along with one's birth and as it leads to certain kinds of actions, some schools of thought have held that *varṇa* is determined by birth, while others have stressed that it is determined by *karma* (actions). Both the schools have overlooked the role of *svabhāva*. A *varṇa* is not a stratum of society determined by the expected set of functions assigned to it, nor can it be conceived as a position determined by the *varṇa* of the parents from whom one is born.

In this background a Brāhmaṇa is one who has realized Brahma or who is oriented to the realization of Brahma. His *svabhāva* leads him to perform only such actions as would help him achieve his goal of realizing the Brahma. The *Gītā* (18.42) identifies such actions as *brahma-karma*. They are serenity, self-control, austerity, purity, forbearance and uprightness, learning about the Brahma (through the Veda), efforts for self-realizing and faith in the existence of the cosmic reality or *nirupādhi* Brahma or *puruṣa* or *iśvara*. The *Gītā* (13.42-44) repeats the word *svabhāvajam* (born of *svabhāva*) after stating the orientation to certain actions of each *varṇa*. It provides the explanation for the origin and categorization of actions. It is in consonance with the *āmnāya*. However, it may not be out of place to mention that *Manusmṛti* does not underline *svabhāva* as holding the key to the actions (*karma*) of various *varṇas*, when it lists their functions. For example, it says that the functions of Brāhmaṇas are studying and teaching, performance of and officiating at *yajñas* and giving and accepting *dāna* (wrongly translated as gift, because gift involves exchange, while *dāna* may not). Therefore, it deviates from the *āmnāyika* notion of Brāhmaṇa and reduces him to the level of a religious functionary needed for ritualistic requirements.

From the above analysis it is evident that puruṣārtha, varṇa and āśrama

are designed for the forward march of the *sopādhi puruṣa* and not for the maintenance of social order. Their scheme provides a frame of action by which the *sopādhi puruṣa* can shed his *upādhi* which separates him from the cosmic reality through *ajñāna* (wrong knowledge by which he identifies himself with his *upādhi*). This forward march requires a transformation in his perspective towards life in general and his actions in particular. For achieving this state he has to rise above all binary oppositions (become *dwandātīta*) and discard all expectations of fruits of his actions.

This *āmnāyika* vision recognizes the fact that the overwhelming majority of men act as *nara* or *manuṣya*. They insist not only on their separate identity, but also on all kinds of separateness. They seek pleasures of the body and satisfaction of their *ahaṁkār* and pursue self-interests. Therefore, they are involved in *vyavahāra* (transactions). The role of *dharma* is not simply to guide them in their *vyavahāra* as well as *karma*, but also to help them realize the destination and direction of their forward march as *puruṣa*. As the concept of *nara* involves the concept of the individual, the increasing role of the individual in the middle class in India pointed out by Professor D.P. Mukerji is covered in the oscillating scheme of *puruṣa*, *nara* and *manuṣya*.

In this perspective, if a society has to be conceived, its boundaries merge into the human society as a whole, and the boundaries of the human society lose their identity in the totality of the phenomenal reality which, in the final analysis, is a part of the cosmic reality. Similarly, there is a continuity between the past, present and the future life of a *jīva* (phenomenal ego) and between this world (*iha-loka*) and the world beyond (*para-loka*) provided by its actions.

Lest it should be taken to mean that the 'lower order of reality' is encompassed in a 'higher order of reality', I may revert back to the *puruṣasūkta* with which I started this paper. Raimundo Panikkar asserts that the creation—sacrifice described in the *puruṣasūkta* 'is neither a merely divine affair, nor a purely human endeavour, nor a blind cosmic process; it is human, divine and cosmic all in one. That is, it is cosmotheandric.' About the relationship between the *nirupadhi puruṣa* ('primordial man' in the words of Panikkar) and the *sopadhi puruṣa* (individual man), he points out:

> The primordial man is not simply another name for a heteronomous God, nor a mere euphemism for an autonomic individual Man, but the living expression of the ontonomic Man, that total reality of which we are a reflection, a reflection *that contains the whole* (emphasis added), indeed, but in a rather limited and all too often narrow way...Without this internal and constitutive link with the whole of reality, any life of contemplation would become sheer egoism or a kind of spiritual narcissism...Authentic spiritual life or *dharmic* existence amounts to assimilating in one's self the maximum possible of the *puruṣa* condition of reality. (1983: 73)

Puruṣa evedam sarvam yadbhutam yacca bhāvyam
Utāmrtatvasye Śāno yadannenātirohati Rg. Veda X, 90, 2

The PURUṢA, indeed, is this all
What has been and what is to be,
The Lord of the immortal spheres
(as well as) the mortal spheres
(born of food).[7]

Notes

1. Some sociologists like Imtiaz Ahmed and T.K. Oommen have objected to the use of the word Indian before civilization or culture when these words refer to what is generally believed to be Hindu. Still I am talking of Indian society in this paper. Therefore, I owe an explanation. My contention is that Indian society has never been unitary. Therefore, we have only two options: either we hold that there is no Indian society/culture/civilization or under the conditions of plurality we designate all cultures existing and at least originating in India as Indian, more so the one which has been the central one on the basis of historicity as well as numerical preponderance. I have chosen the second option, for I consider the former fragmentary and, therefore, dangerous.
2. *Ahaṁkāra* is also translated as hubris. But I feel hubris is just one form of expression of *ahaṁkāra*. There are three other internal instruments besides Ahaṁkāra. They are *mana* (that portion of mind which considers alternatives after registering the impressions of the phenomenal reality by the 'sense organs', *buddhi* [intelligence or that part of the mind which chooses one of the alternative courses (referred to by *mana*) on the basis of the orientation of *buddhi*] and *chitta* (that portion of mind which continuously thinks of something).
3. The words 'society' and 'individual' have been used and defined variously in sociology in particular and Western thought in general. Without going into their controversy I have used them in a general sense which is clear in the text of the paper.
4. The distinction between *karma* (action) and *vyavahāra* (transaction is extremely significant to deserve a fulfledged paper. Here it is sufficient to point out that the word *karma* is used in several senses in Indian texts ranging from rituals to physical acts, and *vyavahāra* (transactions) is used in the specific sense of actions involving exchange and expectations.
5. *Satyayuga* is the first in the cycle of ages accepted in the Indian tradition. The others are *dwāpar*, *tretā* and *kali*. The current age is *kali* described in detail in the Purāṇas and epics. It may at best be characterized in the words of *Srimad-Bhāgvat* as the age of *siśnodarism* (sex and food symbolized by penis and stomach).
6. The word *pūrṇa* is also translated as full. I have accepted Achintya Bhagwan's meaning.
7. The *Puruṣa-Sukta* contains sixteen *mantras*. The present one is the second of them. My apologies to Raimundo Panikkar for translating the fourth line differently. His translation of the fourth line is 'which he surpasses by consuming food'. To me it appears to be most inappropriate translation. The occasion does not demand a detailed explication of the connotation of the word *anna* (food).

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Discussions

KITCHER AND KANT

Prof. Philip Kitcher's book (Kitcher 1983) is regarded as 'a valuable contribution to the philosophy of mathematics' (Parsons 1984, 136-37). This is because, instead of looking at mathematics from the foundationist point of view, Kitcher views it from the perspective of a philosopher of science. Therefore, many of the important issues of the epistemology, ontology, and methodology which received scant attention from the foundationalists are treated in this work with care they deserve.

However, the present paper is mainly devoted to the arguments Kitcher makes against the concept of a priori knowledge of mathematics which Kant had proposed. In the last section alone, we will venture out into the broader field of ontology and show how, basically, Kitcher is also a Kantian.

I

Kitcher's principal aim in writing the book is to answer the two questions: what is mathematics about? How does mathematical knowledge grow? (Kitcher 1983, 6-7). The answer is that the mathematical knowledge of the contemporary individual can be traced through a chain of authorities to perceptual knowledge acquired by our remote ancestors Kitcher (1983). He supports this theory by giving an account of the mathematical reality which will 'forestall worries about how perceptual experience could have initiated the tradition' (Kitcher 1983).

This theory is naturally in conflict with a priorist thesis of mathematical knowledge. Kant's epistemology is one of the foremost a priorist thesis. It, therefore, behoves Kitcher that he should try to refute Kant.

We, however, submit that Kitcher's arguments against Kant are based on convenient misconstructions of Kant's thesis; that Kitcher's criticism fails to hit the target; that the proper criticism of Kant can only be a rival ontology carefully formulated; and that Kitcher's attempt at formulating such an ontology is half hearted. To set this thesis on proper background, let us briefly examine Kant's theories.

II

Kant's aim in writing *Critique of Pure Reason* (Kant 1961) is not to formulate a philosophy of mathematics but to develop 'a science of the mere examination of pure reason, of its sources and limits' (Kant 1961, 59). What suggests to us that there is a faculty called pure reason equipped with certain powers? Kant asserts that judgements like 'the sum of the angles of a triangle is two *right angles*' (I) act as clues to pure reason. He holds that mathematics consists in such statements alone.

What is peculiar about statements like the statement I? Prima facie I is not a reading of what we find empirically. For no number of observations can guarantee the conviction of universality and necessity which is evident in I. Hence Kant calls I an a priori statement. Further, I gives information about a triangle which is not contained in the concept of a triangle. Hence I is a synthetic statement. Thus, I is an a priori synthetic statement.

Kant does not deny that I may be suggested by experience; but the conviction implicit in I is surely not based on experience. For any statement based on experience is haunted by the fear that we may encounter a contrary experience in future. The statement I expresses the confidence that we will not meet with a recalcitrant experience. Therefore, Kant suggests that there is a faculty called 'pure reason' which regulates our experience and thus gives confidence present in I.

Analysing the forms of judgements like I, Kant concludes that there are twelve concepts or categories which regulate the appearances (i.e., unregulated sense impressions). These are the rules given out by the pure reason from its own resources. We have knowledge of an object or a concept means we are able to form judgements about them by applying the categories. How do we apply categories to objects? We reproduce the object or the concept in thought in such a way that the categories are automatically applied to reproductions. These reproductions are called intuitions. Of the twelve categories, six are called mathematical. To apply a mathematical category to an object or a concept we must first construct the corresponding intuition. This, however, must not be construed to mean that we first construct the intuition, then inspect it, and apply the categories. The very construction manifests the applicability of categories.

Where and how do we construct the intuitions? According to Kant, space and time are two forms of intuition. Every intuition is embedded in space and time. Further, the principles of intuition and anticipation of perception render an object or a concept presentable as intuition in terms of extensive and intensive magnitudes. Thus, mathematical knowledge, i.e., a priori synthetic judgements of certain forms, is obtained by constructing intuition in time and space in terms of intensive and extensive magnitudes.

Let us come to statement I and try to understand the foregoing in its (i.e., of statement I) context. How is I arrived at? We, first give ourselves the intuition of a triangle. Now, whatever triangle we may imagine or construct, it will have distinguishing features. How will it be representative?

> The single figure ... serves to express the concept without impairing its universality. For in this empirical intuition we consider only the act whereby we construct the concept, and abstract from the many determinations ... which are quite indifferent, as not altering the concept 'triangle' (Kant 1961, 577). From this intuited triangle we derive I not by logical inference alone but by construction. This construction is the well-known proof in Euclid (Todhunter 1933, 35).

Thus, whatever be the empirical triangle, the intuited triangle is always subject to the constructions of the proof, and hence the sum of its angle will be two right angles.

III

Kitcher's attack on Kant is from within and also from without. For the present we consider the former. We will show that it is based on some misunderstandings.

Kitcher outlines Kant's procedure of gaining mathematical knowledge as follows: 'We construct figures in thought; inspect them with the mind's eye and thus arrive at a priori knowledge of the axioms from which we begin' (Kitcher 1983, 49).

Firstly, there is no 'inspection with the mind's eye', for the very construction is informed by the a priori categories. Hartnack is explicit on this point. Hartnack 1968, 58). However, based on this mistaken view of Kant's theory, Kitcher raises the following two difficulties:

(*a*) There can be confusion between 'the properties ... which reflect the structure of mind and those which are accidental' (Kitcher 1983, 50).
(*b*) The properties which we read off the figure may not be the only properties. (Kitcher 1983).

An intuition is reproduction regulated by categories. Therefore, there is no role for the whims of the individual mind, accidental readings or extraneous properties in the application of categories to the intuition. Secondly, it is not that the knowledge of axioms is alone a priori. Every mathematical statement is derived from intuitions. In the case of the proof of I, for instance, Kant observes: '... through a chain of inferences guided throughout by intuition, he (i.e., the mathematician) arrives at a fully evident and universally valid solution of the problem' (Kant 1961, 579). The axioms are distinguished by their being evident (Kant 1961, 589).

Kitcher further asks:

> How, for example, do I have the right to conclude, on inspecting a scalene triangle, that the sum of the lengths of two sides of a triangle is greater than the third side but not that all triangles are scalene? (Kitcher, 1983, 51).

We have already quoted from Kant to show (Kant 1961, 577) how the intuited triangle is representative. Secondly, that the conclusion about the lengths of sides is the legitimate conclusion and not about the angles is made evident

by the proof of the former. The former conclusion is not based on the inspection of the figure but is evident from the original triangle and further constructions given in the proof (Todhunter 1933, 23).

Finally, Kitcher speaks of the circularity in Kant's thesis. He writes:

> Kant claims that pure intuition can yield the knowledge that line segments are infinitely divisible. Now it is evident that we cannot attain this knowledge by observing a line segment infinitely divided. So what Kant must intend is that we given ourselves a sequence of presentations, showing a continued process of sub-division. Since there are practical limits on our ability to do this, we shall face an awkward question: are these limits structure properties of experience? To resolve this issue we need again that same insight into the structure of experience which pure intuition was supposed to provide. (Kitcher, 1983, 51).

The problem of infinite divisibility occurs in Kant in the second antinomy of pure reason (Kant 1961, 402). When an intuited line segment is divided into two parts, the resulting line segments have the same properties as the parent one, and hence the division proceeds *ad infinitum* (Kant 1961, 459). Kant then comments:

> We are not, however, entitled to say of a whole which is divisible to infinity, that it is made up of infinitely many parts. For, although all parts are contained in the intuition of the whole, the whole division is not so contained, but consists only in continuous decomposition, that is, in the regress itself whereby the series first becomes actual. Since this regress is infinite, all members or parts at which it arrives are contained in the given whole, viewed as an aggregate. But the whole series of division is not so contained, for it is a successive infinite and never whole, and cannot, therefore, exhibit an infinite multiplicity (Kant 196).

This makes it quite clear that, when Kant claims infinite divisibility, he has only the successive or potential infinite in mind and not the completed infinite. Thus, given any k sub-divisions, one has merely to intuit the $(k+1)^{th}$ sub-division. And there are no practical limits to our ability of doing this. So the charge of circularity fails. Kant, at least, was sure that one can intuit successive infinite, for in Euclid only such infinity is contemplated (see, for example, Euclid's proof that the primes are infinite in number).

IV

Kitcher's attack is directed mainly against Kant's insistence that the mathematical knowledge is a priori. He develops the attack in three stages. Firstly, Kitcher argues that the concept of a priori must be restated in terms of the psychologistic epistemology. Next, on the basis of this restatement Kitcher

demands that the a priori mathematical knowledge must be warranted by same process internal to the subject of knowledge. The only candidate to be such a warrant is the process by which the pure reason imposes the categorical framework on experience. Thirdly, Kitcher shows that this process is proved to be a dubitable warrant. We submit that the argument at each stage of the attack is irrelevant to the position of Kant.

The concept of the psychologistic epistemology is borrowed from an unpublished paper of Frege (Kitcher 1979, 247). Kitcher prefers it to the apsychologistic epistemology, because the latter ascribes a privileged status to axioms and bars enquiry into the origin of axioms (Kitcher 1983, 14). Secondly, according to Kitcher, there is 'contingent a priori' apart from the 'actual a priori' or 'ordinary a priori'. By the contingent a priori he means 'a person knows something empirically which could have been known a priori' (Kitcher, 1983, 6). One can distinguish between the two only when one enquires how the two kinds of knowledge are acquired (Kitcher 1983, 7). This is possible only if we adopt the psychologistic epistemology.

Our reply to this introduction of the psychologistic epistemology is twofold. Firstly, axioms like other judgements in mathematics refer to intuitions. They have no privileged role, nor are their origins not inquired into. But Kant's approach is not psychologistic and rightly so, for a psychological approach is empirical and hence uncertain (Hartnack 1968, 69). Secondly, on Kantian grounds the concept of 'contingent a-priori' is absurd. If you trace the source of your belief to experience, then the belief is not a priori, for experience never guarantees necessity and universality which are hallmarks of a priority. If your belief is necessary and universal, you safely trace its origin to pure reason and the categorical framework. Thus, the Kantian thesis is self-sufficient, and needs no extraneous epistemology to justify it, whether psychologistic or otherwise.

At the second stage of the attack, Kitcher says:

> If someone wishes to claim that a particular belief is an item of a priori knowledge, then he must specify a causal ancestry to the belief consisting of states and events internal to the believer ... . If he succeeds in doing this his claim is substantiated (Kitcher 1980, 12).

Kitcher admits that giving oneself the corresponding intuition can be one such process. But here we first show how misplaced this challenge is in the case of Kant.

For Kant the subject of mathematical knowledge is human reason and not an individual. Therefore, the process which can act as a warrant may be taken as the grouping for mathematical knowledge (Kant 1961, 19) which took place in the Egyptian period. What Kitcher calls 'perceptual experience' may be identified with this grouping. If this construction is admitted, then Kant may be seen as anticipating Kitcher. But Kant is emphatic that such groupings

can never lead to certain knowledge which mathematical knowledge is (Kant 1961, 81).

In the third stage Kitcher observes that, if we take the process of pure reason as the warrant for the knowledge that the sum of the angles of a triangle is two *right angles* (I), then this process is proved to be fallible (Kitcher 1983, 53). This is not because a triangle contradicting I has been discovered but because two indirect challenges to I have arisen. The theoretical challenge states that 'a sequence of experiences which suggest that a physics-cum-geometry which does not include I will provide a simpler total description of the phenomena than a physics-cum-geometry which does' (Kitcher 1983). The social challenge to I arises in the shape of experts who deny I and explain how we came erroneously to repose faith in it (Kitcher 1983).

We first note that this is a rehash of the time-worn argument against Kant that the emergence of non-Euclidean geometries has proved Kant false. Here Kitcher is using it to destroy a priority for a change. Secondly, here Kitcher has in mind 'physics-cum-geometry' to which Kant's thesis is not exactly applicable. Kant himself states (Kant 1961, 52) that, if the necessity and a priority of the mathematical statements is objected to, 'I am willing to limit my statement to pure mathematics'. Thirdly, even if we accept that the non-Euclidean geometries falsify Kant, we observe that they do not refute a priority of mathematics but the platonic element in Kant's thesis, namely, that only a limited collection of intuitions is allowed to pure reason. Categories and pure intuitions are a priori in the sense that they regulate experience, but awareness of them comes only after the experience. Hence one may contend that the kind of construction needed for non-Euclidean triangle could not be invoked till experience needed it.

Thus, we find that the specific arguments used by Kitcher against Kant fail to establish that the mathematical knowledge is not a priori. This is not surprising, because Kant's system is closed and self-supporting, and no logical argument can work against it. One can refute Kant only by showing that there is a more profitable way of looking at mathematics. We will show, unfortunately briefly, in the next section that Kitcher's own attempt is at best quite half hearted.

V

Kitcher wants to refute Kant's thesis that the mathematical knowledge is a priori, because Kitcher believes that the acceptance of the thesis comes in the way of tracing the origin of mathematics to perceptual experience. His argument against Kant ends by showing that Kant cannot explain the progress of mathematics from the Euclidean to the non-Euclidean geometry. Is this not a puzzling argument? What is it that the Kantian a priori blocks: tracing the origin of mathematics to perceptual experience or the development from the Euclidean to the non-Euclidean geometry?

We have already pointed out that Kant was not unaware that 'among Egyptians' mathematics existed 'in the grouping stage' (Kant 1961, 19). But, according to Kant, the Egyptians had not discovered the true method of mathematical practice which is 'to bring out what was necessarily implied in the concepts that he had himself formed a priori' (Kant 1961). What Kant means is that for the Egyptians mathematics remained enmeshed in the experience; they had not realized that mathematics was their imposition on experience.

Lange has succinctly summed up the difference between the approach of Kant and that of the empiricists like Mill whose views are akin to those of Kitcher. Empiricists believe that what follows after the axioms are granted is mere logic. Among axioms too, many are definitions. The genuine axioms, like the proposition 'two straight lines cannot enclose space', are mere generalizations from experience. 'It is not that they may some day be refuted but ... that we have no other source for the certainty we attribute to them than for our empirical knowledge' (Lange 1950, 1971). Thus, the so-called axioms are also hypotheses, even though they may be in the form of necessary judgements. To this Kant's response will be: 'If there is a kind of hypotheses distinguished from all others by the necessity of their origination in our minds we gain nothing by the general observation that they are but hypotheses' (Lanfe 1950, 174).

Thus, the basic problem is that there is always a gap between experience and the conviction of necessity and universality, and Kant fills the gap with intuitions. The relationship between experience and the intuitions is kept vague, though it is admitted that experience may suggest the intuitions. That is why Kant says that knowledge begins with but does not arise out of experience.

What is Kitcher's ontology? He introduces the notion of the ideal subject (Kitcher 1983, 109). 'Whose status as an ideal subject resides in her freedom from certain accidental limitations' (Kitcher 1983). For Kant the subject of knowledge is 'reason', not an individual; for Kitcher the subject is the 'ideal subject'. Reason derives knowledge from intuitions and not from the empirical phenomenon. The 'ideal subject' derives knowledge from the 'ideal processes' which are idealized from the empirical processes.

Kitcher may argue that he has shown the relationship between the ideal and the empirical which Kant kept vague. We submit that in doing this he has left many questions unanswered. What exactly are the 'accidental limitations'? Who determines them? Once the powers of the ideal subject are specified, can we not regard them as a priori? Thus, we find that Kitcher has also not solved the basic problem of the gap between experience and the necessary judgements.

It is not the notion of the 'a priori' but the Platonic element in Kant that the attributes of reason are specified once and for all by the rigid categorical structure which obstructs the development of mathematics. Kant might not have any objection, if the non-Euclidean geometry was regarded as a logically

consistent system. But the non-Euclidean geometry cannot be a mathematical system, because the intuitions corresponding to it cannot be constructed (Korner 1971, 28). This is because the constructive powers of reason are specified once, and they cannot be altered. Kitcher overcomes this problem by allowing revision of the powers of the ideal subject (Kitcher 1983, 160).

Here the question is: how do we go from one specification to another? It is curious that in the chapter where Kitcher deals with the mathematical change there is no reference to the ideal subject. The trouble with Kitcher is not that he is an empiricist but that he is a half-hearted one. That is why his ontology of mathematics is not free from Kantian a priori. To formulate a thoroughly empiricist philosophy of mathematics, a reality will have to be postulated where every attempt, successful or otherwise at theory formulation, will permanently dwell and interact with other theories and also with the subject of knowledge. But this will need more extensive discussion.

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THE NATURE AND SIGNIFICANCE OF INTUITION: A VIEW BASED ON A CORE IDEA HELD BY S. RADHAKRISHNAN

[*Before presenting my account of the nature and significance of intuition, I want to state that in this short paper I will simply highlight some of the major ideas which are discussed at length in the book on intuition which I am writing.*

I am indebted to Sarvepalli Radhakrishnan for the core idea of intuition that I culled from his writings, and which inspired the line of thought that I follow in my book. However, sometimes Radhakrishnan speaks as if intuition were a kind of knowledge, or an independent way of gaining knowledge, while, as I will explain, I hold that intuition is simply one *means to knowledge. Furthermore, I argue that any view, according to which intuition is taken to be a form or independent way of gaining knowledge, will be rejected by those critical thinkers who take knowledge to be a discursive process of the mind or the result thereof.*]

Unless intuition is recognized as one means to knowledge, much of human experience is inexplicable and/or meaningless. The problem is that many modern critical thinkers do not recognize intuition as a means to knowledge. Furthermore, since intuition is not so recognized, it is not generally accepted as a criterion for justification of a belief. The problem with not accepting intuition as *one* criterion for justification of a belief is that those beliefs which draw from evidence of an intuitive nature are either ignored or rejected, because they are judged to be unjustified.

The result of this rejection is that many beliefs which make sense of human existence, including both metaphysical and religious beliefs, are regarded as meaningless.

The reason that many rigorous thinkers have been reluctant to recognize intuition as a means to knowledge, and thus accept it as one criterion for the justification of a belief, is that the commonly held view as to the nature of intuition is inconsistent with what these thinkers take knowledge to be.

The commonly held view as to the nature of intuition is that it is immediate apprehension.[1] In general, 'apprehension' means a mental grasping, and 'immediate' means not mediated by the reasoning process. Thus, immediate apprehension is taken to be a non-discursive form or independent way of gaining knowledge. The problem with this view is that, as far as modern rigorous thinkers are concerned knowledge, whatever else it may be, is taken to be the process and/or result of reasoning about experience. Also, since humans can make errors with regard to perception and reasoning, claims to knowledge require justification. Thus, knowledge, by its very nature, is taken to be discursive, i.e., mediated by the reasoning process. Yet, via immediate apprehension, one can make claims to knowledge. Thus, if you and I were engaged in a logical argument and you asked me to state the reasons for a claim that I had made, I could say: 'Oh, I have no reasons, I simply know' ('know' by intuition). I think that the acceptance of any view which could lead to this kind of statement is ludicrous.

In light of the foregoing problems which I have elicited concerning the view that intuition is immediate apprehension, I propose that this view be rejected in favour of the view which I will offer. Given my view, intuition and reason are complementary process of the mind which can, together with sense perception, lead to knowledge.

My view as to the nature of intuition is based on a core idea of that nature which I culled from the writings of Sarvepalli Radhakrishnan. In a loose sense, Radhakrishnan spoke of intuition as any cognitive process of awareness which is direct or immediate in contrast to what is inferential, i.e., mediated by the reasoning process.[2] He included both perceptual knowledge and what he called 'integral insight' in the foregoing sense of intuition.[3] In a strict sense, he confined 'intuition' to integral insight.[4] It is this latter sense with which I am concerned.

Although Radhakrishnan neither defined nor clearly explained what he meant by 'intuition',[5] he did describe it.[6] Based on his descriptions, I take intuition to be an integral process of awareness which culminates in an act of insight. The process itself involves both perception and conceptual activities, including the formulation of concepts and memory. Also, although he sometimes spoke as if inference formed a part of the process,[7] as I indicated earlier, he characterized intuition as non-inferential.[8] Thus, I surmise that he thought that inference forms a part of the memories which are involved in the process, but not the act of insight in which the process culminates.

Finally, based on Radhakrishnan's statements that the whole mind is involved in integral insight,[9] and his observation that one is not an idle spectator in this process,[10] I conclude that the process is intentional or directed.

Based upon what Radhakrishnan said about intuition, Martin Heidegger's notion of a focus of concern,[11] and some of my views about the nature of the intuitive process,[12] I take intuition to be an intentional or directed process of awareness in which present impressions and relevant memories are brought to bear on a certain focus of concern. This process culminates in a mental act of insight. Also, whereas the process is grounded in reason, i.e., reason is used to form many of the thoughts which are now memories, the mental act in which the process culminates includes neither inference nor mental structuring, e.g. the comparison of ideas.

Intuition, as I have described it, is *not* a non-discursive form of knowledge. Neither is it an independent way of gaining knowledge, because I take it to be only one of three interrelated means to knowledge, namely, sense perception, intuition, and reason. Via sense perception, one becomes aware of the physical or material aspects of experience. Via intuition, one becomes aware of those aspects of experience which transcend that which is merely physical or material. Via reason, one structures what is sensibly perceived or intuited. Also, it is reason which enables one to construct and also to analyse logical arguments, i.e., to determine if an inference from premises to a conclusion, i.e., a belief, is warranted. Thus, given my view, intuition and reason are complementary processes which, together with sensible perception, can lead to knowledge.

Accepting the view that intuition is an integral process of the mind, I want briefly to consider what I take to be two kinds of intuition, namely,

penetrative and creative. I am not aware that Radhakrishnan or any other philosopher has identified these two kinds of intuition; yet, it appears to me that these distinctions are implicit in their accounts of the subject.[13]

In take penetrative insight to be the insight into the structure of (*a*) a situation, or (*b*) a problem when the pertinent facts are available. I think that the structures which one recognizes vary from the simple to the complex.

Penetrative insights into simple structures include those in which one suddenly sees a better way to organize some material, perform a task, learn some subject, etc.

Penetrative insights into more complex structures involve problems or situations in which one does not have all the pertinent information available. Several examples are:

(1) A physician who is able to cure a rare disease because of a hunch as to its nature, and a hunch as to the required treatment;
(2) A biologist who is able to discover the full nature and cure of a new disease;
(3) A detective who is able to intuit missing pieces of evidence at the site of a crime; and
(4) A person who can very quickly discern the nature of a situation, be it social, professional, etc.

Penetrative insights into even more complex structures are sometimes referred to as metaphysical and spiritual insights. These are the insights into the nature of reality and/or the source of that reality. Such insights are rare. This is so not only because of the complexity of the structure involved, but because such insights seem to require considerable life experience, maturity, and a high degree of intellectual and/or intuitive development. Furthermore, spiritual insight also seems to require a high level of moral development.[14]

Having stated what I take penetrative insight to be, let me turn now to a brief consideration of creative insight. Via creative insight, one can gain some intimations as to (*i*) the chain of events which may lead to an eventuality or (*ii*) the logical transitions which may lead to a solution of a problem.

With regard to the first kind of creative insight, the chain of events may lead to a scientific discovery, a possible scientific explanation, an invention, a musical composition, or an artistic creation, etc.

With regard to the second kind of creative insight, a series of logical transitions may be steps in a logical or mathematical proof, or simply the steps involved in balancing one's cheque book.

In general, creative insights are not as common as penetrative insights. The exceptions would be the penetrative insights which I have referred to as metaphysical and spiritual. Part of the reason that creative intuition is not so common is, in my view, that persons need to develop their creative abilities and to be encouraged to do so.[15]

One final point about creative and penetrative insights is that they often occur together, e.g. the creative person is often one who has profound insights into the nature or structure of life, and then that person is able to express those insights in some work of art, etc.

Given my view as to the nature of intuition, and that it is one means to knowledge, it should be so recognized, and thus accepted as one criterion for justification of a belief. If intuition is so recognized and accepted, then those experiences, which are difficult, if not impossible, to explain without an appeal to intuition, are understandable and/or meaningful. Also, many beliefs, especially those having to do with ontological or spiritual matters, can be justified.

I believe that the few examples which I have given of penetrative and creative insights make clear that, unless intuition is recognized as a means to knowledge and thus accepted as one criterion for a belief, many of the experiences which I have described and the beliefs based upon these experiences make little sense.

Of course, the person who does not recognize or accept intuition is apt to explain the simple intuitions as simply educated guesses and to dismiss the more complex ones, especially those concerned with metaphysical or spiritual dimensions, as flights of imagination or fanciful thinking.

One thing to note about persons, who ignore or reject intuition and accept only sense perception and reason as means to knowledge, is that they usually want to reduce human experience to one particular dimension, be it physical, e.g. biological, or mental, i.e., psychological, or cultural, e.g. anthropological or sociological, etc.

The problem with any form of reductionism is that it flattens the human experience. Also, those holding such views are unable to account for much of our human experience and many of our beliefs.

Because of the stricture of time I will consider only one human experience, some forms of which are difficult to explain without an appeal to intuition, and others which are impossible. Most of us are familiar with this experience, even if we have not had it.

The experience which I want to consider is often referred to as a 'calling' or being 'called.' This experience can be described as a felt need to pursue some life-plan or goal. The need in question is not simply a desire or psychological drive, nor an attraction to something. Rather, it is an urge to respond some calling or beckoning. This urge impels the person to pursue whatever the calling may be.

The more mundane callings are those with which most of us are familiar, in that we have either had some such experience, or known someone who has. Included in these callings are: the felt need to pursue a vocation, and humanitarian pursuits of either a social or a political nature.

Other more rare callings are concerned with metaphysical and/or spiritual dimensions of experience. I will mention three such callings, and persons who I believe had them:

(1) A person has a call to pursue and understand the nature of truth or Being. Martin Heidegger expressed what I take to be such a calling, when he described his felt need to pursue Being *qua* Being.[16]

(2) A person has a call to live her or his life in pursuit of truth. Mahatma Gandhi comes to mind here. As most of you know, *Sat* or truth was more fundamental to Gandhi's system of beliefs than *Ahiṁsā*.

(3) A person has a calling to study and understand comparative views of truth or reality, and to offer syncretic, or at least harmonious, explanations of these views. Sarvepalli Radhakrishnan seems to have had such a calling.

The mundane experiences of being called, which I have mentioned, are difficult to explain without an appeal to intuition. For sense experience and reason alone cannot adequately account for a response to a call that becomes the very focus of one's life and often the centre of one's being.

The experiences of being called which have to do with ontological and/or spiritual matters are, in my view, impossible to explain without an appeal to intuition. Such is the case, because all that sense experience and reason can give us is some understanding of the physical world. Given these means alone, the ontological dimension of existence and/or the source of this dimension, remain unknowable. Of course, the acceptance of a Heideggerian view of reality, as revealed Being,[17] which I accept, enables one to consider reality as accessible to the human mind (unlike all subjectivist views of knowing, which start with Aristotle and culminate in Kant).[18] However, even Heidegger realized that intuition was needed for the revelation of that aspect of Being which was hidden or unrevealed.[19]

Having explained what I take intuition to be and the significance of it, I want to conclude this paper by again expressing my indebtedness to Sarvepalli Radhakrishnan, for it is his core idea of intuition which has enabled me to develop a view of it which is not at odds with reason. Finally, in tribute to him, I want to say that in my view he fits the Greek ideal of the philosopher-king in that, as President of India from 1962 to 1967, he as a philosopher not only knew what was good for his people but also acted on that knowledge.

Notes

1. For a history and analysis of the term, see Hope Fitz, *Intuition as an Integral Process of the Mind*, a dissertation submitted to the Faculty of Claremont Graduate School in partial fulfilment of the requirements for the degree of Doctor of Philosophy in the Graduate Faculty of Individual Degrees (Asian and Comparative Philosophy), 1981.
2. Sarvepalli Radhakrishnan, 'Reply to Critics' in Paul Arthur Schilpp (ed.), *The Philosophy of Sarvepalli Radhakrishnan*, New York, Tudor Publishing Company, 1952, p. 791.
3. *Ibid.*
4. *Ibid.*

5. I think that part of the confusion was because Radhakrishnan did not distinguish the kinds from the uses of intuition. See Sarvepalli Radhakrishnan, *An Idealist View of Life*, London, George Allen & Unwin Ltd., 1932 Robert A. McDermott (ed.), *Radhakrishnan: Selected Writings on Philosophy, Religion, and Culture*, New York, E.P. Dutton and Company Inc., 1970, pp. 153-60; Radhakrishnan, 'Reply to Critics', in Paul Arthur Schilpp (ed.), *The Philosophy of Sarvepalli Radhakrishnan*, New York, Tudor Publishing Company, 1952, pp. 790-804.
6. Radhakrishnan, 'Reply to Critics', in Paul Arthur Schilpp (ed.), *The Philosophy of Sarvepalli Radhakrishnan*, Tudor Publishing Company, 1952, pp. 790-94; *Radhakrishnan; Selected Writings on Philosophy, Religion and Culture*, p. 160; Sarvepalli Radhakrishnan and J.H. Muirhead (ed.), *Contemporary Indian Philosophy*, London, George Allen & Unwin, Ltd., 1936, pp. 486-87.
7. Radhakrishnan, 'Reply to Critics', in Paul Arthur Schilppe (ed.), *The Philosophy of Sarvepalli Radhakrishnan*, New York, Tudor Publishing Company, 1952, p. 792.
8. *Ibid.*, p. 791.
9. *Ibid.*, pp. 790-91.
10. *Ibid.*
11. Heidegger's notion of 'focus of concern' can be grasped, in part, by studying what he had to say about a region, i.e., the area of one's focus of attention, in which beings come to have meaning for him. See Martin Heidegger, *Being and Time*, New York, Harper & Row, Publishers, 1962, pp. 95-107, 114-22, 138-48. Also, with regard to things, one can gain an understanding of the 'focus of concern' by reading what Heidegger said about circumspection in his *Being and Time*, pp. 98-99, 107, 111-12, 146.
12. From my experience, research, and reflection on the intuitive process, I realized that present impressions and relevant past experiences were being brought to bear on a focus of concern. As one example of this process, consider a philosopher who, while working on a subject, has been struggling with a philosophical problem. Her mental processes have included reason as well as observation, reflection, etc. She leaves the subject for a while (the length of the time will vary with the person and the problem.). When she returns to the subject, the present impressions plus the relevant memories of her work on the subject are brought to bear on the problem. Suddenly, she has an insight. She sees a solution to her problem. The fact of insight does not involve reason, although it is grounded in it.
13. Radhakrishnan writes about creative insight or intuition. See *An Idealist View of Life*, chap. V. Also he sometimes speaks of intuition as a kind of direct seeing into. In his 'Reply to Critics' in Paul Arthur Schilpp (ed.) *The Philosophy of Sarvepalli Radhakrishnan*, p. 791, he says that *pratyakṣa*, direct knowledge, in its original form *intuitus*, implies a sense of sight. Henry Bergson, whose views of intuition were familiar to Radhakrishnan, thought of intuition as a kind of 'entering into'. See, Henry Bergson, *An Introduction to Metaphysics*, New York, G. P. Putnam's Sons, 1912. Heidegger also makes clear that the creative expressions, which found and originate truth, are the result of penetration into the hidden or unrevealed Being.
14. In general, Hindu scholars hold that intuition is a higher process of the mind. As such, it requires both a high level of moral development and reasoning. Radhakrishnan's thought is in accord with this Hindu view. See, Radhakrishnan, *An Idealist View of Life*, pp. 196-99.
15. Hope Fitz, 'The Role of Intuition in Creativity' (Chap. IV) in his *Intuition: Its Nature and Uses in Human Experience* (forthcoming).
16. William J. Richardson, S.J., *Heidegger: Through Phenomenology to Thought*, The Hague, Netherlands, Martinus Nijhoff, *c.* 1963, pp. 4-7).
17. Heidegger holds that that which is given in experience, i.e., Being, is real, and man can come to understand the revealed aspects of what is real or true, because he is the being to whom Being is revealed.

18. Given Kant's view, what is known of experience is mind-constructed. Thus, all man can know is what appears to him. Locked into a world of appearance, he can only speculate as to the nature of things in themselves.
19. This is clear from Heidegger's account of poetry, i.e., the creative expression of an insight into unrevealed Being; his view that poetry founds truth; and that truth is a revelation of Being.

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Book reviews

VIBHA CHATURVEDI: *The Problem of Personal Identity*, Delhi: Ajanta Publishers, 1988, vi+147 pages, Price: Rs. 100.

This book is divided into six chapters. In the first chapter, the author discusses the concept of a person and of a criterion. After a critical appraisal of the Cartesian dualism and the subsequent attempts of A.J. Ayer, P.F. Strawson, Bernard Williams, and David Wiggins, she observes that 'the concept of a person is an open concept' (p. 18). A person, in author's opinion, is 'an embodied being capable of certain types of complex psychological attributes' (p. 18), though it is not possible to enumerate them exhaustively. The best one can do is to describe the kind of psychological characteristics that are ascribable to persons, and a being who possesses a sufficient number of them is a person (p. 18). Chaturvedi is aware of the difficulties of specifying 'the sufficient number', and for this reason she prefers to leave the concept of a person open.

On the question of a criterion, Chaturvedi discusses mainly Wittgenstein's views. She is rightly concerned with the concept not in abstraction but as it is applied to the case of personal identity. So she stipulates that a criterion of personal identity, besides being internally consistent, must satisfy the requirement that 'the judgement obtained by its application should not be counter-intuitive' (p. 29), or 'in conflict with our considered judgements about identity of persons' (p. 29). She would not accept a criterion, if it leads to the rejection of a paradigm case of personal identity 'where both the spatio-temporal continuity and psychological continuity are found' (p. 29). She also requires that the proposed criterion of identity 'should be workable, that is, its application should be possible' (p. 30). Thus, by this rule a criterion which necessarily involves a reference to 'something which is in principle unobservable and cannot be related to anything observable' (p. 30) would not be acceptable to her.

The second chapter is devoted to a discussion of the Cartesian theory of the identity of the spiritual substance. It is refreshing to note that Chaturvedi takes into account the dualistic theories of Bishop Butler and Thomas Reid also. She rejects the Cartesian theory on the ground that it necessarily involves a reference to the spiritual substance which in principle is unobservable. Besides, these theories have two different criteria of personal identity: one for self-identity and the other for identity of other persons with the consequence that scepticism with regard to identity of other persons is engendered, while judgements of self-identity turn out to be trivially true.

In the third chapter, the Humean thesis that the identity ascribed to persons is fictitious is rejected on the ground that the theory involves a faulty

analysis of the concept of identity and of persons which renders it incoherent. Chaturvedi maintains that the identity ascribed to persons is certainly not 'a fiction of imagination'.

In the fourth chapter, she discusses in detail the criterion of personal identity in terms of psychological continuity, which includes similarity of character and personality traits and memories of one's past actions and experiences. The major theories which she considers here are those of John Locke, Sydney Shoemaker, Mrinal Miri, D. Parfit, and David Wiggins. Similarly, in the fifth chapter there is a detailed discussion of the criterion of personal identity in terms of spatio-temporal continuity. Here one gets a good critical account of the views of D.M. Armstrong, Bernard Williams and Peter Geach. In the sixth chapter, certain puzzle cases and the ensuing difficulties for any proposed criterion of personal identity are analysed. Chaturvedi points out that there are grave difficulties in regarding psychological continuity or bodily continuity as a necessary or a sufficient condition of personal identity. 'If the psychological continuity criterion is accepted, cases of amnesia and paramnesia pose a problem. If the bodily identity criterion is proposed, cases of brain transplant raise difficulties' (p. 115). Besides, in the problem cases, the two criteria may come in conflict, thus vitiating the results of their application (p. 115).

From this it does not follow that the question of personal identity is conceptually undecidable. In her view, this question is of the paramount importance, for the vital issues concerning man's rights and responsibilities and his selfish concern for his future presuppose it. She maintains that the criteria of psychological and bodily continuity are both embedded in the concept of personal identity. The paradigm case is one where both the criteria are applicable. Bodily continuity is, however, more fundamental in her view. She suggests to isolate the imaginary cases of fission, fusion and creating replicas of people through artificial means, for no single criterion is supposed to work for all the conceivable cases. It is possible that our present concept of personal identity is theoretically defective, and that we may have to change it in the light of further growth in scientific knowledge. For the present, however, this concept is deeply entrenched in our ordinary language and in our day-to-day individual and institutional behaviour. Chaturvedi accepts this fact as the touchstone of any proposed criterion of personal identity.

Chaturvedi's book makes easy and absorbing reading, thanks to the author's clarity, her good grasp of issues underlying the debate, and her ability to communicate effectively. The book is worthy of the serious attention of scholars and philosophers alike.

I have noticed several misprints in the book, particularly on pages 5, 9, 27, 52, 55, 67, 118, 125, and 132 which can be corrected in a later edition.

University of Delhi, Delhi VIJAY BHARADWAJA

ALBERT W.J. HARPER: *Essays on Kant's Third Critique,* Phelps Publishing Company, London/Ontario, 1989, vi+45 pages.

This is an exceedingly brief monograph consisting of three articles on Kant's *Third Critique*, originally read as seminar papers in Canada and England. Each article is prefaced by an abstract stating the main thrust of the thesis being presented. The common theme unifying the essays is the assertion that there is a strong claim to be made for the worth of universality in aesthetic judgment. The monograph is written from within the Kantian frame of reference.

At the beginning of the general introduction to the monograph, the author writes: '... what we are confronted with is the problem of induction to be dealt with on a cosmic scale ...' (p. v), and at the end of the introduction he states: '... in pure aesthetic judgment we therefore have already attained universality as a premise ...' (p. v). The relation between this kind of universality to the problem of induction has to be further developed. Evidently, induction is being used here in a very special sense.

The first essay in the monograph is addressed to the Kantian treatment of imagination in aesthetics, and is divided into two parts. Part One gives an exposition of what imagination is, and Part Two examines the role of imagination in understanding aesthetic theory. In this essay, several comments have been made on the relation between morality and imagination without a detailed discussion of their mutual relation. This makes it difficult to understand the very subtle Kantian idea of imagination's 'freedom to flourish in a lawfulness of spontaneity and yet remain within a moral domain'.

In the final paragraph of the first essay, the following remark occurs: 'Aesthetics and ethics have this much in common, that there is supreme respect, even awe, reserved for the moral law, which is something of an *imposter* thrust upon the nature of things' (p. 12, emphasis added). This remark will surely be challenged by many Kantian scholars. That Kant spoke of a rivalry between the moral law and the laws of nature has been denied time and again.

The second essay in the monograph is titled '*Anschauung* and Universality', and is also divided into two parts. Part One traces a brief history of how the meaning of *anschauung* has evolved from Ekhart to Kant. After giving a fairly thorough account of Kant's understanding of *anschauung* in the context of art, the author goes on to show how 'the imagination serves to engage the manifold of intuition for an enriched cognition, valid for all consciousness alike and admitting of an expected universal communication for those about to participate' (p. 29). While arguing for this conclusion, the author remarks:

> There is neither pragmatic opposition nor convincing theoretical refutation sufficient to controvert the aesthetic experience taking the form of an

intuition which may, as has already been intimated, have an origin allowing it to dwell in a state of ineffable mysticism' (p. 23).

True ineffable mysticism grants immunity from refutation, but does it provide protection against one's taking an alternative standpoint? The possibility of alternative explanations of an aesthetic experience has far-reaching consequences for 'an expected universal communication'.

The third essay in this collection is a general statement of the Kantian position on beauty and nature, beauty and morality and beauty and purpose. This essay should have come first followed by the first and the second.

All three essays are well documented. A cursory look through the endnotes of all three essays shows that the author, in order to substantiate his views, has drawn heavily on one particular book—besides the *Third Critique* itself—entitled *Essays in Kant's Aesthetics* which is edited by Ted Cohen and Paul Guyer and was published by the University of Chicago Press in 1982.

Apparently, the monograph is a preliminary to a book-length study of the very same issues where these problems are supposed to be discussed critically.

Jadavpur University, Calcutta SHEFALI MOITRA

[Continued]

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