

TWO TECHNIQUES OF
THEORISATION: SCIENTIFIC VERSUS
DARSANIKA KNOWLEDGE

1. According to Karl Popper,¹ who is the latest link in the chain of Western rationalist-empiricist debate, knowledge does not have any infallible base in either senses or reason. Taking modern science as the paradigm of human knowledge, he argues that the process of growth of scientific knowledge involves imaginative proposals of hypotheses or conjectures and their refutation on empirical grounds in a continuing series of steps. Thus, scientific knowledge continuously *evolves* in a series of revolutions whereby the accepted theoretic constructs are falsified, therefore destroyed, and new ones accepted in their place. Experiment, as provoked and controlled stimulation of the senses, plays a *critical* role in this process of growth and so long as it fails to falsify the hypotheses these are *provisionally* accepted by the scientists. Therefore, any given theoretical

¹ Karl Popper, *The Logic of Scientific Discovery*, London, 1956; *Conjectures and Refutations*, London, 1969.

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construction at a given time does not claim the possession of any ultimate truth, but it is considered only partially true and its fall by some falsifying evidence is awaited. Moreover, according to Popper, the imaginative creation of hypotheses is a mental process not strictly logical or rational—the observation statements that occur in these hypotheses may be *motivated* by experience but they are not deduced from it. Similarly, the experimental observations are always *selective* since they are made under the guidance of an anticipatory theory: there is no such thing as pure observation. Moreover, the acceptance of a new hypothesis as a provisional candidate for holding on to in future is also not a rational act since it is based not on any strict reasons but only on belief. Finally, the belief that there must be regularity in nature is more like *synthetic a priori* knowledge since it does not derive from any logical or empirical necessity although psychological and biological justification may be provided for this.

Kuhn's conception² of modern science differs from that of Popper in this fundamental respect that he considers scientific growth not such a neat and clean process of conjectures and refutations but primarily a *social* activity carried out by a community of scientists. In this process of growth of scientific knowledge, scientific collectives are formed with certain attitudes, inclinations and preferences within whose framework the epistemological activity takes place. Paradigms are thus formed which have both intellectual and social-political characteristics. The growth of scientific knowledge is, thus, not a series of revolutions one after the other but, rather, it consists of alternating cycles of normal, conformatory periods of scientific activity and of revolutionary episodes in which the battle between the existing paradigm and an alternative paradigm takes place. Therefore, unfalsifiability of an hypothesis is not the only *protective mechanism* but there are others within the paradigm. Experiment *alone* does not play a critical role in the rejection of a given hypothesis but it may continue to be accepted

² T.S. Kuhn, *Structure of Scientific Revolutions*, Chicago, 1972. See also S. Amsterdamski, *Between Experience and Metaphysics*, Dordrecht: D. Reidel Pub., 1975.

in spite of *refutational evidence*, while the acceptance of a new hypothesis may involve canvassing and winning over of its supporters. Therefore, according to Kuhn, science is an epistemological activity which is essentially carried out by *communities* of scientists. Scientific knowledge is an institution with certain governing rules. The institution as a whole grows and the governing rules may change over a period of time.

2. Now, the central points in Popper's conception of scientific knowledge may be taken to be these:

that the construction of hypotheses occurs *a priori* by a creative act of imagination and the experience plays only a critical role in their refutation;
that a progress in cognition or evolution of knowledge occurs as the old constructs are rejected and new ones accepted; and
that, at any given time the available theoretical construct cannot claim any true cognition in some indubitable sense and is, therefore, only partially true.

And the central point of Kuhn's conception of scientific knowledge may be taken to be this:

that scientific knowledge grows *because* the paradigms are framed by the active community of scientists and the battles, for which there are no well defined rules, recur between rival paradigms.

We shall, henceforth, juxtapose these conceptions and call them Popper-Kuhn conception of scientific knowledge. This conception tells us that the scientific activity carried out by the community of scientists is in fact a *technique of theorisation*. The persons involved in executing and perfecting this technique propound hypotheses and then seek to refute them by designing experiments and searching new evidence and in this process various groups show their allegiance to the hypotheses challenged or the ones propounded or amongst the hypotheses rival to each other and thus carry out *normal* or *revolutionary* activity as the situation demands. The growth of knowledge that takes place thus, consists in the construction of better and better theories

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which not only have greater and greater information content but are also increasingly *sensitive to error*. Greater the sensitivity to error, greater the propensity to falsifiability. Now, the error can occur, in the game of knowledge or theorisation, as misconception or as fuzziness of sense experience. Thus, a theory which is *sensitive to error* must not allow not only fallacious reasoning or inadequate models but also the fuzziness in observation. If the fuzziness of observation cannot be entirely eliminated in principle due to the limitations of human senses, then the theory must explicitly admit this, so that the exposition of a possibly irreducible error amounts to its effective elimination. But the fuzziness in conception must in no case be allowed by the theory if it has to claim a high sensitivity to error. It is possible that at a certain stage in the process of growth, the fuzziness in experience fails to play a critical role in the refutation of a theory which is *perfectly* well conceived, but in that case, such an ideal theory³ can always be modified and *deliberately* desensitised so as to allow the evaluation by the fuzzy experience. If such a thing can happen in future, then one may possibly hope that the process of growth of scientific knowledge has an end and that such a knowledge cannot perhaps be tested for its absolute sensitivity to error, which means error cannot be absolutely eliminated.⁴ It may be thought that the conceptions which cannot be critically examined by experience at a certain stage can indeed be rationally examined and therefore the process need not come to an end. But, then, such knowledge would not remain *scientific* in the strict sense of the term.

The above may be considered only a reinterpretation of Popper-Kuhn conception. However, this conception may be substantially criticised on two scores. Firstly, it admits that in some sense, at certain “places,” the process of scientific cognition is not wholly rational; and secondly, it both underestimates the

³ Such a theory must, in principle, be possible unless there exist some limitations in reason itself, which are perhaps unknown so far apart from the ones pointed out by Godel. Bohm’s idea of “hidden” variables is essentially the same.

⁴ Here a novel claim made by classical Indian philosophers should be noted. They have said that cognition is also possible by non-sensuous experience but only in a certain specific state of consciousness called *samadhi* or *turiya*. If so, it has to be admitted that in that kind of cognition, absolute elimination of error is possible.

role of experience as also it allows it too much say in the critical examination of hypotheses. Let us take up the question of *rationality* first. When it is said that the scientific process has elements of irrationality or that it is both rational and irrational at the same time, what is implied is not that it is inconsistent or invalid in the logical sense. Rather, rationality is here confused with causality or with conformity with established norms which ought to be followed in the acceptance or rejection of the hypotheses. But if a causal apprehension of the psychological process of creative imagination is not forthcoming we should perhaps try out its chance apprehension or teleological apprehension or even taxonomic apprehension before concluding that it is “rationally” inapprehensible. Mere discernment of *patterns* in historical events, for example, is enough to make claims for their rational apprehension. Therefore, a search for more sophisticated criterion of rationality may perhaps be preferred to the acceptance of irrational elements in scientific process. One criterion of rationality may perhaps be this: *that* procedure which can provide substantial *control* as well as *understanding*⁵ is a rational procedure. This criterion allows for the incorporation of chance, e.g., in cybernetics where *random* generation of parameters is allowed and yet substantial control and stability is obtained. And, of course, a satisfactory understanding of the control process as well as of the stability becomes possible.

Further, if certain procedure does not conform with the established norms, it cannot and ought not to be declared irrational. There are processes and methods which may deviate from norms. For example when somebody's behaviour deviates from the norm, we cannot at once conclude it to be irrational. Rather, attempts are made to *explain* the deviation from the norm and

⁵ Attempts have recently been made to distinguish explanation from understanding. It was said that scientific rationality consists in causal explanations of events and facts. But there can be events, such as in the realm of human actions, which cannot be satisfactorily explained causally. Nevertheless, they *can be understood* perhaps without using the procedure of explanation through *laws*. See G.H. Von Wright, *Explanation and Understanding*, London: Routledge & Kegan Paul, 1971; also, J.R. Aronson, “Explanation Without Laws”, *Jr. Phil.*, 66, 1969.

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when the causes or reasons of the deviation are laid bare it becomes rational.

Consider now the question of the role of experience in the process of scientific cognition. In the Popper-Kuhn conception, experience plays a critical role but inertly. It may *motivate* the construction of hypotheses but does not enrich and illuminate the imagination. But can such a position be acceptable? Is it not possible to argue that more and more refined conceptions become possible as one *undergoes* experience? I am not insisting that induction is at work; I am saying that the mind is enriched and refined as it undergoes unexpected and novel experiences. It has been said that in the Christian tradition, a step by step communion with the Infinite was sought to be established by a series of sacraments and that modern science substitutes experiment for the sacrament so as to discover, by a step by step approximation, the secrets of the Infinite Nature. Therefore, the experience in science actually appears to enter in the spirit of a sacrament. Then, again, the role of experience is over-estimated in a different sense. Experience alone cannot play the role of critical examination of the *a priori* theoretic constructions. In science, the experience is provoked and controlled experience which is made possible by experimental design. But the creative requirements for the design of apparatus and conception of experiments are as fundamental as those of theoretic construction. This presupposes not only creative *invention* but technological *practice*. It is, therefore, *practice* which actually plays the role of critical examination of hypotheses and the same creative imagination that backs the conjectures must also back the refutations. The *efficacy* of the theoretical construction must be proved by practice, i.e., by repeated experimentation. The role of practice, therefore, need be restored to its proper place. The conceptual construction that is creatively achieved by reason must be complemented by a matching creativity of practical construction.⁶

The third point that I now want to make regarding the Popper-Kuhn conception is that it is not enough to assert that

⁶ E.B. Wilson, *An Introduction to Scientific Research*, New York, McGraw Hill Book Co., 1952.

scientific process has social characteristics but actually we must insist that it would be *impossible* if it were not carried out by communities continuously cooperating and struggling for the advancement of cognition.⁷ Theoretic constructs will be accepted only if a community of scientists takes interest in testing them; their public character demands that these be established by a community. Most scientists who involve themselves in this game do so because it gives them recognition and promises them better material gains. Theoretic constructs that are proposed get the attention of the community and are systematically debated and honestly sought to be refuted. They result not from some faith and their purpose is not the interpretation or defence of some sacred text but rather they must arise in a paradigmatic context. Thus, in spite of the absence of high motivating ideals such as pursuit of truth, and even in the absence of any divine faith, the game continues to be played by the community for reasons indicated above in whose absence it would quickly decay and die.

Then, again, the importance of *enveloping paradigms* should also be recognized. Enveloping paradigms are constituted by those cultural, religious, philosophical, social and political beliefs and attitudes which dominate in a specific society in a specific historical era. If these paradigms are such that they promote the activities of the community of scientists, then the activity will get a fillip, but if they discourage such activity it may quickly die. The two predominant enveloping paradigms today are Liberalism and Socialism. Both promote the paradigm of science in its modern forms. But if the present psychedelic, mystical and occult trends succeed in getting domination in some societies, then it is not impossible that the game of science will be given up by them.

3. Just as the modern scientific process has emerged in the West as a technique of theorisation in the last five centuries, *darsana*⁸ in India flourished as another technique of theorisation

⁷ K. Marx's contribution to epistemology in this direction is quite well known.

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as many centuries back. Interesting parallels have already been noted between Popper's conception of scientific cognition and the views of Madhymika Baudha Nagarjuna regarding empirical knowledge.⁹ However, actually all the major *darsanas*—the Brahminical (Samkhya, Vaisesika, Mimansa and Vedanta); Baudh; Jain; and Saiva—developed formidable theoretical constructions as conceptions of Reality. All these trends employed *yoga* and *nyaya* as fundamental methodological devices¹⁰ in the technique of theorisation—the former as *practical directives* has a parallel with experimental procedures of modern science while the latter as *science of reasoning* is parallel to the mathematical methods and rules of reasoning in constructing hypotheses in modern science. [This latter parallel is not quite correct since *nyayas* of all the trends included epistemological inquiry as indispensable to any considerations of rules of reasoning. Further, while a general syllogism (which includes Aristotelian syllogism) was ar-

⁸ *Darsana* literally means *in-sight* and all the well known *darsanas* as insights in reality are actually comprehensive *theories* which attempt to *understand* major aspects of reality.

⁹ V.V. Nalimov, "The Receptivity of Hypotheses", *Diogenes*, 100, pp. 179-197.

¹⁰ Patanjali's *yoga* as part of the Brahman trend differs from Baudh, Jain and Saiva *yogas*. Similarly, Brahman *nyaya* is different from Baudh, Jain and Saiva *nyayas*. The reason why these trends have a "religious commitment" to their respective sources is that the "methods" in fact originated there. For some of the sources in *yoga* in these trends, see S. Swamin, *Hathayogapradipika*, Madras, Theosophical Pub. House, 1949; N. Thera, *The Heart of Buddhist Meditation* London, Rider & Co., 1962, B. Bhattacharya, *Gubya Samaja Tantra*, Baroda, Oriental Inst., 1967; P. Siddhanta Sastri, ed., *Sarvartha Siddhi*, Calcutta: Bhartiya Jnana Pitha, 1971; I.K. Taimini, *The Science of Yoga*, Madras: Theos. Pub. House, 1965.

Yoga as a methodological device for Theorisation aims at purification of Reason (*buddhi*). Reason is impure because of confusions and misunderstandings about the world and the self. These confusions have to be eliminated and washed away so that correct understanding may dawn and the reason be purified. The methods that are employed in *yoga* involve various bodily and meditative or concentrative practices so that the psychosomatic system as a whole is cleansed. While the emphasis on these practices differs in different *darsanas* the goal is basically the same. See my *Yoga: A Technique of Liberation*, Sterling, New Delhi, 1979. Also, G. Feuerstein, *Textbook of Yoga*, London, Rider & Co., 1975 and H. Aranya, *Patanjali Yoga Darsanam*, Delhi, Motilal Banarsidas, 1974.

Nyaya as a methodological device for theorisation aims at employment of Reason in *analysis* of the world and the self at conceptual, linguistic levels. The idea here is to expose the fallacies and errors so as to be able to arrive at the correct conception. See references 11-18.

rived at, no *a priori* laws of reasoning were put forward.] It should, then, interest us to contrast the two kinds of techniques of theorisation and to critically examine the conceptions of *darsanika* knowledge also as entertained in these various trends. It may, firstly, be noted that while the techniques differ substantially in respect of the development of the respective methodological devices, the theoretic constructions which are thereby arrived at have striking resemblances with the latest microsciences of the West. Here we may notice the atomic hypothesis entertained by most of the *darsanas*, the incessant dynamism of the “material substratum” emphasized by Samkhya for instance, the momentary and fluctuating nature of “reality” stressed by Baudhas, agreement by all of them that an inner casual necessity operates in reality and therefore the belief in *a priori* intelligible order is justified, and so on. Detailed structures of reality have been worked out by all the *darsanas* and their views on life (*jiva*), matter, motion, space and time have a striking resemblance with modern science. However, the two techniques differ markedly in respect of the aims of theorisation. In the Popper-Kuhn conception the scientific theorisation is justified because it provides a “mastery over nature” whereas the explicit and unambiguous aim of *darsanika* theorisation has been liberation of the human self (*moksa, kaivalya, nirvana, nisreyasa*). In the latter, it was admitted that as the progress towards liberation is made by successive theorisations, “mastery of nature” (*siddhi*) is also acquired (as a by-product, if you like) but this must be categorically rejected since it may obstruct the progress towards total and absolute liberation. The two trends also differ in their fundamental approach towards cognition and consequently in the deployment of the respective methodological devices. Thus, modern science pays no attention whatsoever to the possible modification intrinsically of human perception and tries to make it more and more perfect only by better and better instruments. For this reason, it can observe only a slice of reality at a time. But the *darsana* approach aims at the apprehension of entire reality, of human as well as non-human nature. Since this must include self-knowledge, the seeker must undergo *purificatory practices (yoga, tapa)* so that the conceptions which are propounded during the progress of cognition may be critically

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examined by a *purer* and *purer* reason as also may the instruments of knowledge (such as *sense*-perception, psychological act of inference) be scrutinised so that the errors arising from these latter may be progressively eliminated. For these reasons, it also incorporates the epistemic questions relating to perception and its relation with mind along with the rules of reasoning and criteria of inference in the total scheme of *nyayas*.

We may now consider the various conceptions about *darsanika* knowledge as held by these various trends. The important ones are the Saiva Siddhanta, Mimansa, Baudh (Dharmakirti), Vaisesika, Jain, and Baudh (Nagarjuna) conceptions. There are subtle differences of opinion even within these trends but we must refrain from going into those details here and consider broadly the central aspects of these conceptions. According to the Saiva Siddhanta,¹¹ empirical knowledge, i.e., knowledge obtained by perception, inference and testimony, is false knowledge (*para jnana*). It is false because it is not an essential attribute of the mind (*atman*) but arises only accidentally when the latter is fettered by impurities (*mala*). It is said to be valid only figuratively since it is unmanifest when the true knowledge (*siva-jnana*) is attained by a pure mind. The true knowledge, thus, can be obtained by the cognitive potency of the mind alone (*atma chit-sakti*) which is the only essential attribute (*swarupa laksana*) it has. When the mind progressively cleanses itself of the impurities, it enters a state of release (*mukti nilay*) and thus “acquires” the true knowledge which is the knowledge obtained independently of the empirical apparatus. The false knowledge (*asat jnana*) is itself further subdivided by the Saivas into valid (*yatha-artha*) or invalid (*ayatha-artha*) knowledge. They affect subsequent subdivisions of these two kinds of unknowledge into invalid doubt (*samsaya*) and invalid error (*viparyay*); and valid spontaneous unknowledge (*nirvikalpa*) and the valid deliberated unknowledge (*savikalpa*). Now, the process by which this false knowledge—valid or invalid—is acquired by the mind by virtue of its cognitive potency (*chit-sakti*) proceeds as follows:

When some object is presented to the senses, the *atman* cog-

¹¹ V. Paranjoti, *Saiva Siddhanta*, London: Luzac & Co., 1954; V. Ponniah, *The Saiva Siddhanta Theory of Knowledge*, Annamalai, The University, 1952.

nizes the object spontaneously and non-discriminatively without associating any mnemonic elements such as its name, generic character etc. This cognition is the *nirvikalpa pasa jnana*. Subsequently, certain characteristics of the object are observed and diverse conjectures of the form “this may be so and so” arise. This is *savikalpa pasa jnana*. These conjectures are followed by a searching inquiry into the nature of the object for any specific characters by virtue of which a definite decision may be made. The failure of the *atman* to discover such characters gives rise to doubtful cognition (*samsaya*) which is uncertain unknowledge. Doubtful cognition is the cognition in which the mind cognizes certain characteristics common to two or more objects for lack of observation of specific characters. The state of doubt of the mind brings in its train a definite cognition of the object as such and such. The cognition here is *savikalpa pasa jnana* or *viparyay* according as the characters cognized do or do not belong to the object. Therefore, the doubtful cognition may endure for a period in certain cases representing a state of suspension before it passes over as *savikalpa pasa jnana* or *viparyay*.

The Samkhya conception¹² and the Vedanta¹³ conception about empirical knowledge are also quite close to the Saiva conception although they have considerable differences of opinion regarding the details of the process of cognition as also about the question of a cognitive potency of the mind. But we must refrain from going into these controversies and pass over to the Madhyamika Baudha (Nagarjuna) conception¹⁴ of cognition. Nagarjuna’s scepticism is ultimate since he denies truth to all the cognitions of the mind, empirical or *a priori*. According to him the very act of conceptualisation is a negation of the only absolute truth which is nothingness (*sunya*) and therefore any dogmatic speculation (*drsti*) must be curbed so as to arrive at the non-conception as the only truth (*sunyata-sarva-dratinam*). This is to be achieved by a dialectical development of reason which would, by critical examination, expose the falsity of every positive conception; as

¹² G.S. Musalagaonkar, ed., *Samkhya Tattva Kaumadi*, Varanasi: Chaukhamba Samskrit Series Office, 1971.

¹³ G. Jha, *Samkara Vedanta*, Allahabad, University Press, 1939.

¹⁴ Th. Stcherbatsky, *Buddhist Logic*, Vol. I and II, New York: Dover Pub., 1962.

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also, by a deliberate effort, strive for *suspension* of all speculation so as to arrive at the truth which is nothingness.

Just the opposite of these positions will be taken from the point of view of common sense or the generally entertained opinions by the people at large which has been referred to as the Lokayat view¹⁵ by the Indian thinkers. This view would imply that the only true knowledge can be that which is gained through the senses since there is nothing like *atman* or mind but only the body. The activity occurring in the body as a result of its interaction with the objects is to be called knowledge which alone can claim truth under certain conditions. More refined common sense may allow inference as the aid to knowledge but never the testimony. The conceptions that are arrived at by sense experience and, in some cases, inference, can be claimed to be true by ascertaining carefully whether what is asserted does obtain.

Consider now the intermediate positions entertained by some trends. According to the Mimansakas,¹⁶ all knowledge is intrinsically true (*swatah pramanyam*) be it *a priori* or empirical; it is reliable *by itself* since it is knowledge not error. But it *can* turn out to be an erroneous cognition subsequently, when it is, firstly, counterbalanced by another and stronger cognition (*baddhaka jnana*) or, secondly, when its *origin* is proved to be defective (*karana dosa*) as in the case of wrong colour perceptions. Therefore, every knowledge is by definition true unless it is proved otherwise by subsequent operations of the mind. Baudha

¹⁵ Contemporary Indian philosophers have generally accepted Lokayat as a *darsana*, that is, a systematic theoretic construction, and have tended to identify it with materialism. However, Lokayata, it seems, has never been a *darsana* but rather the classical philosophers used this title to represent the uncritically accepted beliefs, through custom, of the common man in the world regarding questions of the philosophical interest. That is why they all began by critically examining such common sense opinions and showing their falsity. In fact, one of the institutional or social aims of *darsana* has historically been this fight against the all pervading, self-perpetuating and naturally organised false notions concerning questions of philosophical interest. Here it may be noted that modern science has also systematically refuted the uncritically accepted notions which were defended and even pedagogically perpetuated by Christendom at one time. However, its methods of refutation, contrary to the purely critical reasoning of *darsanas*, have been more *powerful* and decisive mainly because of the experimental technique. Its beginnings may, then, be traced to the initial battles against the paradigm of common sense notions.

¹⁶ G. Jha, *Plurva Mimansa and Its Sources*, Benares, Hindu University, 1942.

Dharmakirti holds a view just the opposite of this. According to him every cognition is intrinsically unreliable and erroneous; its reliability can be ascertained only on subsequent investigations. The test of truth of any cognition is its efficacy—through consistent experience and practice truth becomes established. If an idea has arisen, it is not enough by itself to maintain its own truth. There is yet an uncertainty about it (*anischayat*) since discrepancies are possible (*vyabicharat*). However, subsequently, when the cognition has been examined as to its origin (*karana-guna-jnanat*), when it has been found to agree with experience (*samvada jnanat*); and when its efficacy has been ascertained (*artha-kriya jnanat*), only then can we maintain that it stands for truth. On the other hand, while we are indeed in possession of an unsensuous source of knowledge, say reason, we have to admit that it is not independent, it cannot go beyond experience. Here non-contradiction has to be the test of truth. That is to say, when our reasoning has discovered either a case of necessary succession, or of necessary co-existence or of the absence of an ascertainable object, then there will be no room for contradiction. Therefore, when the facts of succession, coexistence or absence are established as the real conditions of real things, these facts are not founded on fancy but they stand as stands reality itself. Besides, pure perception (*suddham pratyaksam*), pure object (*suddha arthab*) and pure reason (*suddha kalpana*) are certainly not given in experience, but they are not contradictory; they are even necessary as the *a priori* conditions of the very cognition; they are real, being non-conceptions (*sunya*).

The Vaisesikas¹⁷ maintain that knowledge by itself is neither true nor false*. It can become the one or the other only subsequently. Experience is the test of truth as well as of error. The causes that lead to cognition do not produce truth or falsity, it is the *foreign* causes that do so which may well lie in the subsequent experience.

* Nyaya in the Brahmanical trend may be considered as the logic of the Vaisesikas.

¹⁷ D.D. Sastri, (ed. & tr.), *Nyayadarsanam*, Varanasi: Bhartiya Vidya Prakashana, 1966: A.B. Keith, *Indian Logic and Atomism*, New Delhi: Oriental Books Reprint Corp., 1977.

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Finally, the Jainas¹⁸ maintain that every cognition is both true and false (*ubhayam svatah*) by itself, without needing any test by subsequent experience. It is the condition of cognition that makes it possible for us to assert the cognition as true or false which is soon negated as those conditions change—whether in perception or in conception. Every cognition arises in a context and countless contexts are possible for it. Moreover, the embodied mind (*jiva*) can cognize only in this or that context so that a context-free, true cognition is not possible for it. Therefore, clearly, when a specific cognition is true in one context, it can be proved false in another.

Now, the central contentions of these various theories¹⁹ about the nature of cognition may be summed up as follows:

¹⁸ D. Bhargava, *Jain Tarka Bhasa*, Delhi: Motilal Banarasidas, 1973; K.C. Sastri, *Jain Nyaya*, Calcutta, Bhartiya Jnana Pitha, 1966.

¹⁹ The positions taken by various *darsanas* regarding truth and falsity can be derived from an analysis of unreal knowledge (*asat jnana*) and real knowledge. Empirical knowledge is unreal because it has in it the possibility of doubt and error. Only *Siva Jnana* is real because it involves no doubt, no error. However, unreal knowledge can be said to be true (*yatha-artha*) or false (*ayathartha*) in a significant sense. When the cognition is *as* the object cognized, it is true; when it is *not as* the object cognized, it is false. But what is the *artha* in *siva jnana*? There is no *artha* because it is objectless knowledge; therefore, we cannot ask whether it is true or false. Therefore, we have two mutually exclusive cognitions: one which is unreal and yet true or false; the other which is real but neither true nor false. Now the question is whether we can say that any specific unreal cognition is absolutely true? Certainly, such assertions are possible for some basic observation statements. Next, can we ask about a whole set of cognitions (theories) conjointly whether these are true? Indeed, it must be possible if we specify in advance the scope (the range of objects cognized) of such cognitions. But can clear limits of this scope be laid down?

Now, as it obtains, at the micro-level we cannot even claim that a specific unreal cognition is absolutely true even for basic observation statements. That means, at the micro-level, even for unreal cognition, we cannot ascertain whether it is true or false. [Is this a limitation of the *chitisakti* itself or a limitation arising due to the indispensability of the sense-apparatus? This question cannot be answered unless we admit that cognition bypassing the senses is at least possible]. Therefore, the only difference between unreal cognition and real cognition is that while for the former we *can* ask whether it is true or false (although we may not be able to categorically answer it), for the latter even such a question is absurd. When, therefore, we cannot ascertain truth or falsity clearly, we have the following choices for expressing this situation:

- 1) Unreal cognitions are neither true nor false (Vaisika Nyaya).
- 2) Unreal cognitions are both true and false (Jain Nyaya).
- 3) Since we cannot ascertain their truth, unreal cognitions must be accepted as false [Saiva, Baudha (Nagarjuna)-Nyaya.]
- 4) Since we cannot ascertain their falsity, they must be accepted as true (Mimamsaka nyaya).

according to the first view, the so-called cognition through the empirical apparatus is not real cognition and the conceptions that are so formed are true or false only figuratively; the only absolutely true cognition is the *siva-jnana* or the *brahma-jnana* or the *purusa jnana*, which is acquired gradually as the unreal cognitions are progressively rejected;

according to the second view, the truth is arrived at by negation of every form of cognition so that, paradoxically, the only conception that is absolutely true is that there can be no true conception; this truth is to be reached only progressively by effort at arresting dogmatic speculation and its negation as and when it tends to occur;

according to the third view, every cognition is necessarily true unless refuted by subsequent *superior* cognition or proved false as to its origin; the progressive *refinement* of truth consists in searching out original defects (*karana dosa*), such as misconceptions, so that more and more refined conceptions may replace the existing ones;

according to the fourth view, every cognition is intrinsically uncertain and therefore false unless supported by defectless origination, experience and efficacy; *a priori* cognitions are also false unless proved to be non-contradictory by virtue of their being supported by necessary succession, necessary co-existence, and *abhava*;

according to the fifth view, no cognition can be held true or false unless it is given the test of experience; the cognition by itself has no *intrinsic* truth or falsity—the causes which make cognition possible cannot be such that they affirm or negate it; it is rather the foreign causes which subsequently refute or support it;

and lastly, according to the sixth view, every cognition by itself, without needing any foreign support, is both true and false because the cognizing mind has intrinsic limitations and can cognize only in this or that context so that the cognitions are necessarily partial and incomplete yielding to truth in one context and to falsity in another.

Let us now compare these conceptions about *darsanika* knowledge with the Popper-Kuhn conception of scientific knowledge.

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One contrast that we immediately notice is that while the former completely ignores the social nature of cognition, therefore the social dimension of reality, the latter makes it a central feature of epistemological activity. It is a well recognized historical fact that the growth of *darsanika* knowledge in India occurred through debates in which different conjectures about reality competed. That is to say, the battles between paradigms was one significant factor in the progress of *darsanika* knowledge; some paradigms lost the battle quite early—such as the Samkhyan paradigm—and dwindled into obscurity, while others—such as the Buddhist paradigm—suffered a similar fate much later. In spite of all these facts, however, there was no explicit recognition of the fact that epistemological activity is social in a significant sense. The second important contrast is that while the experience (*anubhav*) that was sought to be contrasted with the conceptions could be *provoked*-experience,²⁰ it was never sought to be controlled, or measured to perfection. Moreover, the notion of experience did not remain confined to sense experience alone, but it included in it even the non-sensuous experiences such as dreaming, thinking, memory right up to the end which was said to be “transcendental experience” (*sivanubhav*, *swarupa-sunya*, *sunya*, *brahma*). For this reason, since the experience was not subjected to precision, the conceptions themselves too lacked exactitude.

[The third contrast which must be recorded is that while science bows to no authority except that of truth itself, all the *darsanas* sooner or later succumbed to the dictates of

²⁰ Yogic experience is indeed provoked experience for it can be had only by methodical operations on one's own psychosomatic system. It differs from the provoked experience of modern science in the fact that in modern science the psychosomatic receptor system is treated as *constant* and left untempered. The notion of experience can be analysed so as to make clear how it is treated in *yoga*. For this we may think of three *degrees* of experience. The experience of first degree is predominantly the controlled or uncontrolled, provoked or unprovoked stimulation of the receptors. In the experience of second degree we may imagine that the stimulation of receptors is ideally eliminated but controlled or uncontrolled, provoked or unprovoked stimulation of the “mind” persists. Example: A man sitting in a sound-proof, smell-less room with eyes closed having dreams or thoughts or drug experience. In the experience of third degree there is complete absence of any stimulation of receptors or of the “inner sense” (or “mind”). This may be called the experience of self-absorption or *samadhi*.

textual authority. Thus, for example, Baudha *darsana* emerged as a paradigmatic alternative to Brahminism and spurned all the textual authority to which the latter bowed, yet, as time passed, the former enslaved itself to the authority of its own texts. This pervasive feature of the *darsanas* raises a fundamental question: whether these are theologies or philosophies or some entirely unique form of knowledge having features of theology, science as well as philosophy? It is perhaps better to understand them as *ideologies*.²¹]

Let us now attempt a critical examination of these various conceptions of knowledge entertained by these various *darsanas*. Two general defects may be noted in all these conceptions. Firstly, although there is a disagreement whether the cognition had by “empirical” apparatus is real or unreal, there exists a general agreement amongst all these views that both the doubtful (*samsay*) and the erroneous (*viparyay*) cognitions are falsities. Doubt was considered by most of them as a *cognitive instability* of the mind which, being unstable, would eventually resolve itself into either error or certain falsity, or it would turn out to be the truth of the *savikalpa* (deliberate cognition) kind. Since doubt was conceded to be a falsity, the notion of *probability* or of *probable knowledge* could not emerge. A doubtful cognition carries with it a degree of truth (or of falsity) and the degree to which it is true is shown by its efficacy. An examination at the origins of the doubtful cognition, as well as the experience can provide us reasons why one must learn to live with doubt and not exclude the middle (of the true and the false). Secondly, there is generally an agreement about the view that cognition is a quality or attribute of the mind although opinions differ about the question whether it is a necessary, permanent attribute or it is a contingent, emergent attribute. The question, however, is to what degree does this quality inhere in the mind? For instance, when it is said that “The jar is blue”, one may ask what shade of blue is meant. The shades of blue range from navy-blue to sky-blue, the former merges

²¹ Ideology is unlike “religion” which is predominantly (or even primarily) a belief system. Ideologies, on the contrary, are partly belief systems but primarily rational systems.

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into black while the latter merges into white. Just as it is meaningful to ask about the “degree of blueness” of the jar, one may analogously ask what are the degrees of cognition of the mind or to say the same, what is the “resolving power” of the mind? Is this quality of the mind such that we can really clearly mark when the cognition ceases to be cognition, as also whether its *sensitivity* to error is absolute so that it is meaningful to talk of absolutely errorless cognition? If not, the degree to which *a priori* and empirical cognitions are inherited by the mind need be clearly specified.

Then, if we consider the first and the second views, we find them, quite obviously, self-contradictory. In the first view, if it be said that the knowledge acquired by the empirical apparatus is knowledge only figuratively and actually unreal, one may ask whether this statement of the situation is knowledge or not? In the second view also, if all conceptual constructions are to be denied, then how is such denial possible except in terms of some construction? Again, when it is said that the erroneous conceptions are *gradually* destroyed or that false speculation is gradually arrested, one must ask how this destroying or arresting proceeds? If there is a progress *towards* truth then one greater and stronger falsity must be replaced by another lesser and weaker falsity or the negating construction must be superior in some sense of the construction being negated. Therefore, it appears either a contradiction in terms that a lesser falsity can replace a greater falsity, or it leads us into an ultimate invincible ignorance if we are caught into the chain of progressively superior falsities.

The third view is more or less the same as Popper’s conception of scientific cognition and our criticism of that applies to it also.

The fourth view is akin to the logical positivist conception of scientific cognition but it is much more rigorous in that it does not base its “verifiability” or truth-criterion on experience alone but also on efficacy or practice apart from requiring various logical criteria such as of necessary succession, co-existence and absence (*abhava*). According to Popper, for instance, no finite number of observations can establish the truth of a universal statement such as “All crows are black.” But Dharma-

kirti would hold that although such cognitions can be ascertained empirically, their efficacy cannot be ascertained, therefore these cannot be the *candidates* for truth. The efficacy of the universal statements, such as “wherever there is smoke there is fire,” can be examined as we can always test *by practice* whether the concomitance of smoke with fire is true. Therefore, universal statements of this form alone would be the candidates for truth. However, the Humean objection of the lack of any “rational necessity” even in such forms of universal statements would remain and I wonder if Dharmakirti or his followers sought to tackle it.

For examination of the fifth and the sixth views, we should invoke Frege’s distinction between sense and reference (or nominatum) of a statement. Let us ask, in Fregean context, what is meant by saying that no cognition can, by itself, without the test of experience, be said to be true or false? That is to say, what is meant by saying that no cognition can be said to possess a *truth value*? Now, according to Frege, cognitions must have truth-values because they refer to *nominata*. Cognitions, if they are judgements, must not be considered as merely the apprehensions of thought, but the acknowledgements of truth. In every judgement “a step is made from the level of thought (or propositions) to the level of *nominata* (the objective facts).” If it be said that we need assume no *nominata* as in the case of analytic cognition $a = a$, it may be replied that a statement $a = a$ is not a genuine cognition. But statements of the form $a = b$ must be considered as genuine cognitions if we interpret them as “a” and “b” naming different senses but referring to the same *nominatum*. Then only can we understand such genuine identities as differing only in their manners of presentation of the fact but standing for the same fact.

Again, the very presentation of a sign or a name gives the context of its presentation. While it may not be the case that every *nominatum* have a definite sign or name corresponding to it, every name or sign must have a definite sense corresponding to it and that sense must have a definite *nominatum* corresponding to it. That is why it becomes possible for us to go beyond the sense of a name and penetrate its *nominatum* so that the truth may be embraced. And when the context of presenta-

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tion or the sense changes while the nominatum remains the same, the truth value of such a sign or name does not change since it is determined not by the sense but the nominatum. One may, however, argue that when it is said that cognitions are neither true nor false or that they are both true and false, what is actually meant is that the truth-value of statements is *indeterminate*. That is to say, it is impossible ever to ascertain whether a given sense has a *definite* nominatum corresponding to it. For example, in micro-physics, it is impossible to obtain identity relations of the following kind: "The electron at point P¹ (x₁, y₁, z₁, t₁) is the same as the electron at point P² (x₂, y₂, z₂, t₂)." Here we can see that the identity cannot *in principle* be obtained because the empirical assertion whether the nominatum corresponding to the name "the electron at point P¹" is the same as the nominatum corresponding to the name "the electron at point P²" can be definitive because of the fuzziness or indefiniteness of the experience involved.

However, if we can provide strong *rational* grounds in favour of the identity it should in principle be also possible to establish it. For example the identity: "The sun that rose in the east yesterday is the same as the sun that is rising in the east today", could be established because strong rational grounds were provided in its favour. Similarly, if our cognitions can predict the future position of any electron along with the quantum of fuzziness that must of necessity be incorporated, then, at least on rational grounds, it can be asserted that the same nominatum definitively corresponds to the two senses although such correspondence cannot be *established at present with the given empirical apparatus*.

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The Popper-Kuhn conception of knowledge has emerged from the paradigm of science which is the paradigm of "exact" and "reliable" cognition. The various conceptions of *darsanika* knowledge as entertained in India emerged from the paradigm of *dharmā** which has always been conceived to be the paradigm

* *Dharma* is hollow without *vijnan* and *vijnan* hollow without the backing *dharmā*.

of errorless, absolutely true cognition. The former paradigm, however, tends to exclude serious investigations into human nature while the latter similarly tended to exclude systematic investigations into non-human nature. However, recent trends in western science indicate that a new paradigm is vigorously emerging which may be called the Cybernetics-Informatics-Physiology-Psychology paradigm. If the paradigm successfully grows, it is quite likely that *yoga* as a methodological device becomes relevant to that cognitive inquiry. In this new paradigm may be included the areas of perception, measurement, intelligence, processes of central nervous system (such as brain activity), dreams, sleep, abstraction, association and so on. Human body is here seen as a complex bio-mechanical *system* with unique features such as *feedback*. These *scientific* studies of the empirical apparatus as it is given and also as it behaves under varying conditions, are expected to provide simultaneously the clues to both human nature (human consciousness) and complex non-human nature (organised systems). Since *yoga* involves manipulations and restructuring of the empirical apparatus as well as the empirical consciousness (the psycho-somatic system as a whole) its central importance to this new paradigm becomes immediately obvious. Therefore, in this paradigm, one may expect the exploitation of both the techniques of theorisation—the scientific as well as the *darsanika*. Further, since the notion of chance and probability is central to this paradigm, new views on the nature of cognition may emerge or some or many of the views discussed above may get strengthened. What these views will possibly be, it is too early to say.

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