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Grammar, Logic and Mathematics: Foundations of the Civilizations Man has Built

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Civilizations are rooted in the capacity for self-reflection, or self-conscious reflection on that which man naturally does, or finds himself doing. And, some of the most natural things man finds himself doing are 'speaking', 'thinking', 'counting' and 'measuring'. Much of this activity is crude, incoherent, almost inarticulate. Man's speech is almost like that of animals: at least, that is the way it appears to those who do not know the language. A tower of Babel, someone said. Well, it is almost that. Walk a few miles towards the countryside and you do not understand the language you thought you knew. What the linguists call 'dialect' is a theoretical concept coined for certain cognitive purposes. What actually exists is language and language alone, one that one understands and the others that one does not.

But if one is asked 'What one speaks of', one can hardly answer with assurance or certainty. One has to 'speak' to reply and one was already speaking when one was asked, and even when one speaks, the other may not understand. What one speaks is 'speech' to the other, something that is 'spoken', something that is an 'object' to be 'listened to', to be 'understood'. And, the fact that one *can* understand makes one feel familiar with, share to a certain extent the other's living reality, participate in it and thus 'build' a 'world' which otherwise would not have been there.

Language, thus, when 'spoken' builds a 'world' which those who 'understand' inhabit as they live in it. The world so built, is not built once and for all. Rather, it is built and re-built continuously, each speaker adding to it something 'new' and thus changing it to a certain extent, opening possibilities that did not exist before and sometimes 'closing' those that existed earlier.

Language that is 'spoken', however, is not the same as the language that is written even though both are called 'language'. The former is the one that one lives with and lives in, the latter is an 'accident' that may occur or not occur. And even when it does occur it takes a long time for it to become a primary, integral part of life. Total literacy is a rare thing in any society, and even when it does occur only a few 'live' in it.

The distinction is well known, as also the discussion regarding the primacy of the one over the other. The permanence, independence and the context-free character of the language that is written have been emphasized, perhaps over-emphasized, by its protagonists. The counter-evidence presented by the achievement of practically the same characteristics in the oral tradition, particularly as presented in the Vedic and the Āgamic texts of India, is generally ignored or underplayed or, at times, even flatly denied as being possibly true on empirical grounds. What is, however, even more surprising is to find the demand for a specification of the 'hidden' context of what is written in order that its mask of impersonality may be removed and it may be revealed as what it is, a product of its time, space, culture and person. Who wrote what, when and where and for whom are the standard questions asked these days as unless these are known, one cannot start assessing the value, worth or authenticity of the text concerned. The Marxist critique had at one time dismissed the past products of a whole culture or civilization as 'class-products', just as today they are branded as 'brahmanical' or 'colonial' in character. At another level, the demand is to reveal your 'location' as if that were to determine the 'truth-value' of what you say, forgetting that it is always a minority and therein only a very few persons that engage in such an exercise and that they normally do not get much benefit out of it.

The transition from 'speech' to 'writing' has, however, another dimension which has been totally missed in this discussion. It is the conferment of a metaphysical dimension to language, a sort of 'ontic' being which, in spite of its ambiguity, it can never lose from now onwards. Language now has a 'being' of its own, a palpable 'objectivity' demanding to be respected, deciphered, cogitated, understood, and this process is 'unending', almost 'infinite'. The task of understanding

the 'world' takes a back seat to that of understanding what man has said. God's world becomes secondary to that created by man, and man henceforward is fascinated by his own 'self' as reflected in what he creates which is, and has to be, primarily linguistic in character. The history of the exegesis of texts from the earliest times and the controversies surrounding them is an evidence of this.

But what 'writing' introduces is something even more than this. After it comes into being, there arises a new distinction among men. The distinction between the literate and the non-literate, those who can read and those who cannot. The distinction does not vanish, as is generally thought, by the achievement of literacy on the part of one, as not only the task of 'understanding' a language is 'unending', but the languages themselves are indefinitely many, diverse and various. One 'knows' the fact of 'illiteracy' amongst those who are literate, but one always hides from oneself the fact that there *are* languages one cannot decipher or read and that they are, and shall always be, far more than those that one knows or can hope to know.

But the other languages remain always the 'other', and even though the task of 'understanding' ones own language is 'unending' one feels that one belongs to the class of those privileged few who are engaged in this exercise and can engage in it. The exclusiveness and the distinction is already there, but language has not yet become the 'object' of study which it will become when instead of asking what does it mean, one will ask what it is? To ask this question is to look at language in a new way and, strangely, to look at oneself also in a way one had not looked at before. The 'being' of language in which one was totally immersed when it was only spoken, and which became a little distinct and distant, and even mysterious, when one 'saw' it as written, or even as 'orally fixed' through repeated memorization as in the case of the Vedas, now reveals a regularity and a structure as if it possessed a real being of its own like other 'beings' of the world.

The discovery that language has a 'grammar' which can be deciphered and articulated has momentous consequences for man and the society and culture in which it occurs. Pāṇini's is a classic example, though there does not seem much awareness of the far-reaching impact that his discovery had not only on the civilization wherein he had

lived; but on the brahmanical personality that was shaped from that time onward. To be an 'Indian' was to speak and write in the Pāṇinian way, no matter if you were a Buddhist or a Jain or even a Cārvāka. And, if you did not, you could not be counted amongst the class of those who were regarded as 'educated' in the country, even if you knew some other language and could write that very, very well as many did, say, in Prakṛt.

But grammar is not the only thing in which the self-consciousness of a civilization may take shape and, in turn, shape the 'personality' of that civilization. Thought which articulates and embodies itself in language may itself become an 'object' of reflection and one may ask the question what makes one spontaneously say, or judge, that what the 'other' has said is 'wrong', or what the other is saying does not 'follow' from the grounds he is giving for it. Logic is the usual name given for this though, perhaps, the term 'Pramāṇa Śāstra' or 'Pramāṇa Vidyā' as given in the Indian tradition expresses the idea better.

This, in a sense, is even stranger than the discovery of grammar, as language is at least an 'object' in some sense as it is 'heard' or 'seen', while it will be difficult for anyone to think of 'thought' in these terms. Yet, this has taken place, for man is not only a 'talking animal', but one who argues all the time. To make this 'arguing activity' itself an 'object' and 'see' it in terms of 'right' or 'wrong', 'correct' or 'incorrect', 'valid' or 'invalid' is a strange exercise as one thereby exposes oneself, one's 'subjectivity' to a determination by something which claims a universality which language cannot do.

Language, as everybody knows, is always some particular language and the grammar that one discovers is confined to it alone. One may talk of universal grammar, but what one has is always the grammar of a particular language, even if one may regard it as the only language in the 'real' sense of the term as the Pāṇinians did in India.

But there is a deeper difference between logic and grammar besides the universality of the former and parochiality or provinciality of the latter. The former can brook no exceptions, no deviations as the latter can. A fallacy is a fallacy, and cannot be treated as a variant or dialect in the manner that linguists have preferred to accept them even when they have formulated the grammar of their language. The search for

universals of language or universal grammar is, ultimately, a search for that universal logos which logic tries to discover and which the specific particularity of language can never accept as its 'being' lies in its 'particularity', a fact known to every creative writer in that language.

The rendering of the activity of 'thinking' into an 'object' for critical reflection and the search for those universal principles which determine and distinguish 'valid' from 'invalid' thinking opens a new dimension in the history of a civilization. Aristotle is the famous name in the western tradition, just as Gautama's is in the Indian tradition. What is the name of the Chinese in this context is difficult to say. Did the Chinese develop a grammar of their language or a 'logic' comparable to the one developed in Greece or India is not easy to determine. Yet, there remains a nagging suspicion that if there is a civilization, it must have had something analogous to these, as otherwise it will not be able to achieve that 'objectivity' in respect of itself which is necessary for it to become a civilization.

The 'objectification', however, creates a dilemma as it results in a new bondage from which man wants to be free. The seeking for freedom from 'grammar' is expressed in many ways, some of which are even legitimized as exceptions or what Pāṇini calls '*apavāda*' in his system. But as those who speak do not much care for the grammarian, the latter imposes his rules through what he calls 'education' on the one hand and through building what may be called a socio-cultural hierarchy based on linguistic usage resulting in the creation of a new elite based on what Pāṇjali called '*sādhu prayoga*' which roughly may be translated as standard prescribed usage both in speaking and writing of the language concerned.

A still different kind of freedom, however, is sought by the creative writer who does not much care for either the Pāṇinian or the Pāṇjalian formulation as he can easily observe all the 'rules' they formulate but is not satisfied by what is produced by their observance, for, what results is something 'dead', lacking the life-breath which makes the language vitally and vibrantly alive and thus 'life-giving' to the listener and the reader alike.

Freedom, however, has a meaning only if there is something to be 'free' from or to do or to achieve or to bring about a state which is

worthwhile in itself, something that is 'good' or 'beneficial' or both; in short, something that is meaningful, fulfilling and joy-giving to the beholder and the creator alike. There has, therefore, to be what every creative artist knows, an 'inertia' which resists as it is already there and has a nature of its own which has to be respected if it has to 'accept' the creative impulse which, at least for it, comes from 'without'. This is the problem of motion, but in other realms there is something analogous to it, and the more one knows the 'laws' or the 'ways of working' of the material one has to deal with, the greater is the resistance in it which presents a challenge to one to actualize what one imagines to the extent of ones own abilities whose limits are never known.

The cycle is unending and the game of 'bondage' and 'freedom' that it involves has seldom been seen for what it is. The problem that is posed by the rules that self-consciousness discovers in the realm of 'thinking' is, however, of a radically different kind. They, in a sense, constitute the norm or the standard which determines what 'ought' to be and the impulse or the desire to seek 'freedom' from them is a desire either to go back to a condition where self-consciousness did not obtain and one lived, as an animal does, according to 'rules' or 'laws' or 'something' that was immanent in ones being or to remain self-conscious, be aware of the rules, 'see' their relevance or irrelevance in the context of concrete situations, be prepared to modify, reformulate and even violate them if the occasion demands; in short, be 'free' in respect of them in a responsible manner which emanates from the fact that whatever the 'rules' or 'laws' that self-consciousness has discovered, they can never be complete, or invariably productive of the 'good' or the 'beautiful', or even the 'true' through their observance by man in his behaviour.

This truth which is only vaguely felt by the creative writer and the thinker in the context of grammar and logic respectively become clear when one reflects on mathematics as a self-conscious seeking or discovery of the humankind. Unlike grammar or logic it is not generally considered to be the result of a self-reflection on the part of a more or less pre-existent activity of his such as that of 'speaking' or 'thinking'. But mathematics is also the result of such a self-reflection, though it

is not generally seen as such because we do not have two distinct names for the activity that is 'reflected' upon and that which results as a consequence of the activity of reflection. 'Counting' is the activity that is reflected upon and which, as everybody knows, gives rise to that which is known as 'arithmetic'. Russell is supposed to have said that this way of understanding mathematics is a mistake and it is false, if taken literally, as it would confine it to that which is countable in principle and to that alone. But mathematics is far wider and deals with that which can not be counted in the sense in which one counts chairs and apples. But, in spite of this, what Russell has forgotten is that even 'counting', when reflected upon, gives rise to a 'world' which one would not have become aware of if one would not have reflected on it, just as one would not have become aware of 'grammar' or 'logic' if one had not reflected on language or thought.

What one discovers to ones amazement and surprise through a reflection on 'counting' is the realm of the 'infinite' and the 'truth' about it. What can be counted are things, not numbers, which always extend beyond those one has counted and one need not, and usually one does not, pay attention to this. But the mathematician does, and it is he who, like the grammarian or the logician, makes the 'ordinary' human being aware of the 'mystery' that lies all around him and in which he is immersed each time he speaks or thinks and argues or counts.

The self-articulation of the realm of mathematics is as unending as those of language and thought, and the 'unendingness' of the discoveries therein are as baffling as anything can be. After all, why should not 'knowledge' in the field of linguistics or logic or mathematics cease to grow? The illusion of 'finality' has gripped these subjects many a time but man's mind has refused to accept the constraints imposed by the rules or the laws or the 'absolutes' discovered therein. Languages continue to proliferate, many of them die, still others 'refuse' to be deciphered and those that are supposed to be 'living' increasingly lose 'intelligibility' even amongst those who consider themselves linguists and talk of 'universals' of language. As for logic, 'thinking' does not seem to care much for the 'fallacies' it unearths all the time and the rules it formulates for thinking to be as 'correct' as it can be. And, what seems even stranger, thinkers flout them all the time and sometimes

even invent reasons for justifying their violation or, at times, invent new logics to expose the limitation and inadequacies of the 'old'. The logicians themselves have now begun to see the limitations of the older formulation and responded with the creation of all sorts of logic whose 'use' and 'relevance' they alone can understand. Perhaps, they think that their task, like that of the pure mathematician, is the creation of as many alternative systems as possible, so that they may be available for possible use by anyone who needs them. The wares should be available in the logician's shop as they are supposed to be in that of the mathematician's.

But the mathematician's enterprise seems essentially different from that of the logician's as the former seems to throw light on a realm which is designated by the term 'number' while the latter's does not, at least *prima facie*, seem to do so in respect of 'thinking' or 'thought' or 'reasoning' with which it appears to be concerned. The concern of course is not to 'describe' that which is studied as that would be to lapse into 'psychologism' but to find rules which if followed, would lead to reasoning whose correctness or validity or 'truthfulness' would depend on the fact that the rules have been followed.

The problem of formal correctness is analogous to that of 'grammatical correctness' and both seem to be related to their being prescriptive rather than descriptive in character. But the recent extensions of the realm of logic and its attempt to build different kinds of logic in order to 'accommodate' all sorts of different kinds of 'thinking' seems to suggest something different. In this process of 'accommodation', logic seems to be patterning itself on those developments in mathematics which started with the creation of non-Euclidean geometries in the nineteenth century. All reasoning begins to have a character of 'if, then' where even the rules of derivation may be made as flexible as one likes. One subtly assimilates it thus to the realm of fiction and art on the one hand and to that of sports and games, on the other.

But the extensions of logic have somehow not proved as fruitful or given as 'surprising' results as those that were found in mathematics. One reason for this is that the realm of mathematics was itself the result of innumerable such extensions in the past. Long before the rise of non-Euclidean geometries, the discipline had seen its extension in

directions and domains which are usually designated as negative, rational, irrational, complex, transcendental and transfinite by students of the subject. But whatever the nature or direction of the extension, it brought 'infinities' into the very 'being' of that which seemed finite and limited to the 'unmathematical' eye.

The story of the journey from 'irrational' to 'transcendental', or 'transfinite' is one where each step forward resulted in puzzlement, paradox and wonder leading to the question whether to believe or not to believe in the 'reality' of what was discovered. The latest attempt to exorcize all the troublesome questions by chanting the *mantram* of 'constructivism' is to forget that, in a sense, everything is a collective human construct over historical time except that 'x' which is a residuum, a known-not-what, a 'something' leftover called by different names such as 'nature' or matter or that which is 'given' as presupposed by human construction to occur and that to be a 'construct' does not mean to be 'unreal'. And, *qua* 'construct', the infinity of positive integers whether construed as an infinity or not, to use the technical distinction introduced by some recent theorizers on the subject, is what we ordinarily do not encounter in the world. There are no infinities in the world and yet the moment we see it with the eyes of mathematics it appears surrounded and submerged in a sea of 'infinities' which the mathematician is still trying to fathom after millennia of effort since he stumbled upon it.

All civilizations discovered the puzzling, paradoxical mysteries of language, thought, counting and measuring but they were not *equally* struck by them. Nor did they see each of them as 'objects' to be understood and studied and create *Śāstras* or scientific disciplines on the basis of their study. Yet, at least one of them had to be formulated and treated as a paradigmatic model of what 'knowledge' meant in that culture. Man had to see himself self-consciously as an 'object' and try to understand himself in order that the breakthrough from culture to civilization could occur. But what shall be made an 'object' and wherein shall man see himself mirrored in terms of knowledge must have been an 'accident', an accident that determined the character of that civilization.

Civilizations, then, may be distinguished by the fact whether grammar or logic or mathematics first achieved the *Śāstric* form or that which is nowadays called 'science' and whether man conceived of himself and reality primarily in 'linguistic' or 'logical' or 'mathematical' terms. The quantitative-calculative view embedded in the last is at variance with the ones embedded in the former, and so also is the notion of 'infinite' involved in it different from the one that is encountered when one is struck by the phenomenon of self-consciousness in man.

The last, however, is a negation of all the three we have mentioned, and as the latter constitute what we have called 'civilization' as it is a result of the way man sees himself 'objectively' in terms of the one or the other, the 'history' of any civilization may be seen as the result of a tension or conflict between that which negates and that which is negated and the way it is negated.

The other side of the story is the influence of that which is negated on that which negates it. In other words, how objectification of consciousness in the field of grammar, or logic or mathematics *changes* the consciousness when it reflects on itself, after the objectification. The mirror reflects and the reflection changes that which was reflected in the mirror. Those who have questioned this have been deceived by the objectification and have forgotten that nothing is static in the situation, the mirror or the reflection or that which is reflected. A little retrospective look at history would have been sufficient to convince anyone of this. But philosophers 'live' in a 'timeless' world where 'history' just does not exist. Yet 'history' does or at least the 'history' of philosophy does to which the philosopher who 'refutes' past philosophers attests by this very fact. And if history exists, so does the interaction between the successive 'objectifications' in which man has tried to see himself objectively and the 'subjectivity' that tries to do this in time.

Śabda Pramāṇa in Sāṅkhya

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The Sāṅkhya system, like most of the other systems of Indian philosophy (barring Cārvāka, Bauddha and Vaiśeṣika), has accepted Śabda (verbal testimony) as a valid source of knowledge. However, the question arises as to the exact interpretation of śabda pramāṇa in this system. Just as there is controversy with regard to the origin of Sāṅkhya—whether it is Vedic or anti-Vedic—similar conflicts are there regarding the exact implication of verbal testimony in this system. Does it imply Vedic scriptures as the source of knowledge or not? A meticulous study in this context shows that the prominent interpreters of Sāṅkhya philosophy are in favour of including Vedic testimony under śabda pramāṇa of Sāṅkhya. However, one group of thinkers opposes this view on the ground that Sāṅkhya is anti-Vedic in origin and character. The present paper, through an exposition of the views of both camps, and on the basis of a brief study of the origin and development of Sāṅkhya, purports to arrive at the conclusion that śabda pramāṇa in Sāṅkhya definitely includes Vedic statements provided (emphasized by later Sāṅkhya) they conform to reason.

One unfortunate thing about Sāṅkhya, one of the most archaic systems of Indian philosophy, is that most of its original literature is lost to us. The earliest available authoritative book is Īśvarakṛṣṇa's *Sāṅkhya-kārikā* which flourished around the second century AD. The Sāṅkhya account depicted in it is recognized as the classical form of Sāṅkhya. Now, in *Sāṅkhya-kārikā*, which is a short and compact form of the Sāṅkhya doctrines (comprising seventy-two verses only), we do not find any detailed discussion about the means of knowledge there. The terms which have been used there denoting verbal testimony are Āptavacana and Āpta-śruti. We first come across the term Āptavacana in the fourth verse where perception (dṛṣṭam), inference (anumānam)

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