

The Science of Social Sciences

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HUMANS HAVE TWO STREAMS of thought: one to understand the nature of outside world, the other to mould human beings into an ethical society. The former takes them to science of nature, the latter to philosophy or religion. Science enriching the knowledge of educated persons had existed for four hundred years; as a source of economic technique for two hundred years. In this brief period it has been a powerful revolutionary force; and scientists have established a fair degree of consensus among their community on the nature of the world and how to comprehend it.

Ideas of philosophy and religion have developed in human consciousness since the antiquity. These objects are complex and controversial; their scholars have not reached a common ground of understanding. As a result people's idea of an ethical community varies from group to group. Hence the two streams of thought—natural science on the one hand and philosophy or religion on the other—often appear *contradictory*. On this count, Copernicus and Galileo, for example, had to bear a heavy burden as their scientific theories allegedly violated the canons of religion.

Newton was himself a deeply religious man, a believer in the inspiration of biblical sermons. Before Einstein, most scientists thought Newton had deciphered God's ultimate laws by proving them from the facts. Einstein has made major contribution to the quantum theory; but he did not accept the quantum mechanics because it had incorporated Heisenberg's 'uncertainty principle'. When asked why, he said: 'I cannot think that God plays dice with the cosmos.' Einstein was a devout believer of religion of one kind or another at this time or that. These instances imply that the two streams of thought need not always clash, nor breed animosity among people. History has, however, witnessed severe consequences with the acts of *fanaticism*.

Can the mode and methodology of natural science be applied in another field, namely, the study, practice, or other forms of enrichment, of the ethics-oriented society, encumbered as it is with belief, faith, or religion? Among the discoveries of science in recent times the most influential two are the theory of relativity and the quantum mechanics. They are not consistent; both cannot be true in general. And this very inconsistency has directly encouraged scientists to search for a unified field theory. Pure theoretical research is one of the methods of how science moves ahead; another is the experiment or empirical test of theory.

Science proceeds in two ways: Reductionism, and Structuralism (also known as Systemic). Explaining complex things by reducing them to their constituents and analyze them one by one

is an act of reductionism. Biology, for example, depends on chemistry; chemistry is merely the physics of molecules and atoms; atoms are made out of electrons and nuclei; nuclei contain protons and neutrons, and protons and neutrons seem to be made of quarks. Science studies all of them one by one; as well as at their highest level, i.e. their totality. In the words of Nobel Prize-Winner, P W Anderson, 'More is Different.' So it is in the case of society as well. So it is in human life-process.

The constituents of a given thing have certain relationships among themselves within that thing. The set of these relationships is known as the system. Study of the system, not the individual elements as such, is known as systemic, alias structuralism. The 'scientific materialism' of Marx, for example, analyzes capitalism in terms of a system of struggles between two classes, namely, capitalist and proletariat --- this is systemic, i.e. structuralism, by itself. But in the sphere of transition from feudalism and capitalism towards communism the horizon is wider; in that contest, Marx's study of capitalism in isolation is myopic, hence incomplete, if not misleading.

1. Evolution of History: The concept of an atom as an indivisible component of nature was first proposed by early Indian and Greek philosophers. In the seventeenth and eighteenth centuries, chemists provided a physical basis for this idea. Newton worked with that premise about nature. The founder of classical economics, Adam Smith (1723-1790), was searching for a methodology appropriate for his work on a vast field extended from astronomy, jurisprudence, ethics, literature, to the political economy. He preferred the Newtonian method of 'didactic' discourse rather than that of Aristotle, or of Descartes. The distinctive feature of Newton's work was in the fact that he sought to establish scientific principles in a certain way. Those interested in the scientific study of mankind at this time were eager to apply the Newtonian vision to a new sphere, and to employ the experimental method as an aid to the discourse of those laws which govern the behavior of man in the society.

Smith proceeded to explain complex problems in terms of a small number of basic principles, and each conformed to the requirement of the Newtonian method in the broad sense of the term. All three of his works, i.e. ethics, jurisprudence, and economics, make use of the typical hypothesis that the principles of human nature can be taken as constant. The works of Smith made a degree of systemic thought of such a kind as to reveal a great capacity for model-building, and to delineate the boundary of a single system of thought, of which these separate subjects were the component parts. 'It is not from the benevolence of the butcher, the brewer, or the baker, that we expect our dinner, but from their regard to their own interest.' Smith observed this day-to-day fact of human life. He constructed a model of the economy from this simple observation: people buy and sell commodities in the market, for their own interest. The analysis of this exchange of products is called 'micro-economics.' Thereby, a stream of social sciences came into light. Thereafter, evolution began.

Impact of the scientific revolution of Darwin brought History into science. Science was concerned no longer with something static and timeless, but with a process of change and

development. Evolution in physical science confirmed and complimented progress in history. Social scientists began to think of society as an organism. So long scientists assumed that laws of nature, such as Newton's laws of motion, had been discovered and definitely established, and that the scientist was to discover and establish more such laws by process of intuition from observed facts. The political economists had been the first in the field: Adam Smith, Malthus, and Marx among others. Marx in the preface of *Capital* claimed to have discovered 'the economic law of motion of modern society'.

'There is a general crisis in the human sciences: they are all overwhelmed by their own progress, if only because of the accumulation of new knowledge and the need to work together in a way which is yet to get properly organized.' Year 1929 was a decisive moment for French history when the *Annales d'histoire 'economique et sociale'* was founded by Lucien Febvre and Karc Bloch. The authors of the *Annals* would break-down history into successive levels: within historic time—a geographical time; a social time; and an individual time. The first is an enquiry into history, almost changeless, the history of man to his surroundings. It is a history which unfolds slowly and is slow to alter, often repeating itself and working itself out in cycles which are endlessly renewed.

Over and above this unfaltering history, there is a history of gentle rhythms, of groups and groupings, which one might readily have called social history if the term has not been derived from full meaning. It looks at successively at economies and states, societies and civilizations. Lastly comes the third part, concerned with traditional history, history, so to speak, on the scale not so much of man in general as of man in particular. It is a history, called the history of 'events': a surface disturbance, the waves stirred up by the powerful movements of tides; a history of short, sharp, nervous vibrations. In history, an event implies a short time span, a matter of moments. The recent break with traditional forms of nineteenth-century history has not meant a complete break with the short time span.

For good or ill, this world dominates the problems of the *longue dur'ee*: the history of the long, events of the very long time span. A new kind of historical narrative has appeared, that of the conjuncture, of the cycle, and even of the 'inter-cycle', covering a decade, a quarter of a century and, at the outside, the half century of Kondratieff's classic cycle. The conception of *Annales* about history has received a distinguished name: the Total History, whose span ranges from the short time zone to all the way to long time destination. It covers the *nouvel sonnant* (the history of events, i.e. a matter of moment) as well as the *longue dur'ee* (the long range).

Another useful key is to determine the mode and theme for history. Claude L'evi-Strauss' has introduced 'structural' anthropology toward the procedures of linguistics, the horizons of 'unconscious' history, and the youthful imperialism of 'qualitative' mathematics. He leans towards a science which would unite under the title of communication science, anthropology, political economy, and linguistics, among others. By structure, observers of social questions mean an organization, a coherent and fairly fixed series of relationships between realities and social masses. For historians, a structure is, of course, a construct, an architecture, but over and

above that it is a reality which time uses and abuses over long periods. Some structures, because of their long life, become stable elements for an infinite number of generations. They get in the way of history, hinders its flow, and in the hindering it shapes it. L'evi-Straus is particularly concerned with universal, that is, basic social and mental processes of which cultural institutions are the concrete external projections or manifestations. He considers the relation among phenomena, rather than the nature of the phenomena themselves, and the systems into which these relations enter. His originality lies in the emphasis on form, on the primacy of relations over entities, and on the search for constant relationships among phenomena at the most abstract level. His generalizations, however, always depart from empirical observations and return to it.

2. Examples : In the *longue dur'ee*, ancient China over three millennia displays two outstanding features. Its civilization has formed the world's largest body of culturally unified people, aptly expressed by the patriotic slogan: One China, One Culture. Confucian value system was one of the main links that connected the peoples. No matter what elements of civilization, peoples or cultural traits, came to China, they got integrated.

On the eve of the first millennium BC, the reign of Shang dynasty met its end at the hands of Zhou warriors. In 1040 BC, the Zhou dynasty was installed, signalling emergence of the Chinese state. A new capital was to be built. Shang elite families were welcomed to join the work of construction and to engage their skills in ritual and government. Other Shang families were transported to populate and develop the west. The vanquished Shang elite and the victorious ruling class of Zhou coalesced. Such is the genesis of the Chinese tradition of cultural and social absorption that would stand the test of time.

Where Shang rulers had venerated and sought the guidance of their own ancestors, the Zhou claimed their sanction had come from broader impersonal deity, Heaven, whose mandate might be conferred on any family that was morally worthy of the responsibility. It was an important moment. The Zhou had introduced an ethical ideal into China's society that had hitherto been little concerned about morality.

Under the Zhou, China had made great progress in clearing the land, cutting down woods and forests, and developing more land for cultivation. There was now less territory available for hunting and the breeding of sheep and cattle. All activities of the noble class were transformed into an elaborate ceremony. A new ritual science was prepared by small groups of scribes, diviners, astronomers, and archivists. The children of younger sons or of second-class wives were beneath the ranks of barons and great officers. Some of them got engaged in composing the foundational five classics, and codified the ceremonial practices of noble families.

The teaching of Confucius (551-479 BC) had sought a three-fold balance between individual dignity, right, and duty. A major Confucian principle is that man is perfectible. It stresses the equality of human beings at birth. Men are by nature good and have innate moral sense. They can be led in the right path through education, especially with their own efforts at self-cultivation, as well as through the emulation of models. The Confucian code of personal

conduct had come from examples narrated in the classics which go back to the Zhou period. China had been a stronghold of the family system. Family had been a microcosm, the state in miniature. The family, not the individual, was the social unit as well as the responsible entity in local politics. The filial piety and obedience inculcated in family life prepared the individual for loyalty to the ruler and obedience to the constituted authority in the state.

Ancient China had met repeated invasions from the nomads of Inner Asia, i.e. originally non-Chinese regions abutting China in a wide arc running from Manchuria through Mongolia and Turkistan to Tibet. In the third century BC, the Qin dynasty unified the territory of China, established a common system of writing, and formulated a state ideology based on Confucianism. Emperor Qin built the China-for-ever with four principles: (1) Confucianism; (2) one common language in the midst of numerous dialects; (3) written test for government services; and (4) respect the Heaven. Thus began the imperial period; with some discontinuity it lasted for two millennia. During the last thousand years North China has been ruled more than half the time by alien invaders. The Inner Asian nomads could prolong their rule only by adopting the Chinese institution of hereditary monarchy and the forms of Confucian government. The Mongols had learnt it the hard way. They were unable to assimilate Chinese culture and make it their own: they were full nomads, unaccustomed to agriculture or settled life. Their background was illiterate, language strange, costume outlandish, and their moral and legal codes, the *Yasa*, designed by none other than Genghis Khan himself, inconsistent with Chinese traditions. So the Mongol rule over all China could not complete even one century. Inner Asian invaders were superior warriors and the Chinese had set up social institutions and feelings of cultural superiority. By assimilation of the two, Chinese history has embraced both the Chinese and the Inner Asian non-Chinese peoples. Even today the Chinese state assigns to the 'autonomous regions' of minority nationalities more land area than to the Han Chinese majority.

The famous Chinese bureaucracy was founded not so much on the celebrated literary examination as the basic fact that care of waterworks meant action well beyond the limit of any single feudal lord's estate. With the absence of regular wages to the officials and poor communications; this led to China's bureaucratic-imperial feudalism which lasted till the early years of the past century. The imperial Chinese society had not allowed urban trading or manufacturing class to flourish. The bureaucracy had two wings: imperial scholar-officials, and degree-holding scholars who could not make it to official grade in examinations. The latter were more numerous. In a country of over four hundred million people, a century ago, there were less than twenty thousand regular imperial officials but as many as one and a quarter million degree-holder scholars outside official rank. The imperial government remained a superstructure as it did not directly enter the villages, leaving them to the care of rural gentry, thereby opening avenues for occupations of these degree-holding scholars. The imperial treasury was too thin to bear the burden of heavy salary bill for the bureaucracy; so, more or less open corruption was permitted. Extra-legal income of an official has been variously estimated at as high as between four times to twenty times the regular salary. The village gentry

were the main reservoir from which the scholars emerged. For the gentry, therefore, the bureaucracy constituted an alternative way of squeezing an economic surplus out of the peasants and city dwellers as well. By and large, bureaucracy had been a more powerful and effective instrument than landholding, though one could not exist without the other. Landed wealth came out of the bureaucracy, and depended on the bureaucracy for its existence. They made a vicious circle. Prospects of commerce and industry were nipped in the bud through extortion by the bureaucracy, while Confucian values held the society together.

If having a degree in classics were so lucrative, why didn't millions of students go for it, flood the market with degree-holding scholars, thereby bringing down the rate of bureaucratic extortion? Had that happened, one of the obstacles to industrialization and democracy might have been mitigated. The answer is that the study of Chinese language and classical literature was strenuous, time consuming, and too expensive for a poor family to afford. Continued domination of gentry's families over the peasantry was assured not only by landholding but also by the fact that the gentry mainly produced the scholar class from which officials were chosen. This near-monopoly of scholarship was made possible in turn by the nature of the Chinese language. A comparable outcome obtained in ancient India as well, where a large section of people, the sudra, was debarred, by the force of ritual codes, from learning *Sanskrit*.

Material condition and value formation together had determined the situation in China. Harnessing the technology to tame mighty rivers and connect the vast territory from one corner to another, the Chinese empire acquired an unprecedented longevity. And the tenets of Confucianism provided solace to the people. An unintended consequence of it all was ossification of tradition and institutions that worked to close the channels of social mobility. The gentry appropriated the economic surplus-product (in Marxian terminology) to squander it in luxury. The class structure in China remained static blocking transition to the stage of industrialization and capitalism: the social equilibrium was stable enough to withstand waves of invasion by the pastoral nomads of the plateaus of Inner Asia.

At the time of the Shang dynasty in China, in 1500 BC, the Aryans immigrated to India from the Caucasus region where people were more familiar with horses than with ox-carts. Being pastorals, they had no word for 'plough', or 'furrow', or 'threshing floor'. The people of Mohenjodaro-Harappa had. The Aryans probably learnt about plough and their use from the indigenous successors of Harappans. They probably were not engaged in arable farming in Caucasus. Harappans were veterans of cultivation with flood-irrigation. The merchants of Harappa used to export copper and luxury items (peacocks, ivory and ivory products such as combs, apes, pearls, and cotton textiles) to Mesopotamia, and had observed high yields of farmland with canal irrigation on the banks of Tigris and Euphrates. Yet they did not bring home information about the more productive technology of canal irrigation. Because crop production in the Indus Valley was controlled entirely by the famous Temple that ruled the economy and society with a firm hand; hence the merchants would not have gained at all from improved production of grain. Economic considerations influence choice of technology.

The Aryans were unaware of architecture or urban life. The Indus Valley civilization had founded, as early as 3021 BC, the twin cities of Mohenjodaro and Harappa, identical in plan and design. All in all, the Aryans, wise people, realized that they had a lot to learn from the successors of Mohenjodaro-Harappans. That set the tone and temper of Aryan expansion in India: Aryans needed the expertise of indigenous people. Nothing would be destroyed; everything would be preserved and assimilated in a grand synthesis—a unique exercise of civilization-building.

The Aryans had brought with them the *Rig-Veda*, of ten-thousand verses, verses to be learned by heart and handed down by word of mouth, with impeccable constancy, for at least five hundred years, before being committed to writing. The responsibility to shoulder this burden of memorized knowledge was shared with tribal bards, seers (risis), and shamans, all not necessarily of Aryan descent. Eventually, these bards and shamans would develop into a hereditary class of priests, brahmans. With the arrival of more settled and secure lifestyle, the clan leader looked to the brahman rather than the battlefield for his authority. The great gatherings of fire-sacrifice (*yajna*) were displays of solidarity, pomp and power on the part of the clan leader. For him, elaborate rituals were conducted by brahmans. The *Yajurveda* (Taittiriya Samhita) described enormous sacrificial development, shown by the long list of animals to be killed along with sacrificial horses, to the point where animals to spare for such occasion became hard to find. The *Yajurveda*, completed in about 800 BC, signalled an imminent end of the Vedic era. It was the time of Kurukshetra war of the Mahabharata, a late edition of which would show the dying royal grandfather Bhishma proclaiming ‘burning down forests as a major sin’. The time for preservation of natural resources was coming. Days of elaborate fire-sacrifice were over—the agrarian era began: the Maurya Empire took over.

The sacred *Rig Veda* had taught India four classes of human beings: Brahman, Kshatriya, Vaishwa and Sudra, in descending order of so-called social “purity”. The law-giver, Manu, by dubious method, sought to defend enumerable castes within each of the four classes; society got fractured. In the fifth century the civilization of India reached its Golden Age. Thereafter decline and stagnation set in.

This study of China and India is “structural” in mode, *longue dur’ee* in history, and both empirical and theoretical. It bears a message: Society is not ergodic, i.e. not forgetful about the past; the starting point affects the course of its journey. To poet T S Eliot : ‘Time present and time past, / Are both perhaps present in time future.’ ‘The inherent properties of things are produced by the mode or manner in which they arise,’ said Vico. Some call it the ‘path dependence of history’. To understand the present, a grasp of the past is essential: it is a hypothesis, a theory, open to falsification by valid argument.²

Rational Belief: He begins with what he considers a crisis of the Enlightenment. ‘At bottom, the mistake of the Enlightenment project is the failure to see that rationality is as such an abstract capacity. Its rules are abstract ones, such as that contradictions are to be avoided or (perhaps) that one should pursue what one believes to be good and avoid what one believes to

be bad. Such rules are at best a necessary, not a sufficient basis for determining (in conjunction with non-normal information about the world) the validity of any moral norms.' Rationality is not anything like a Platonic essence, its contours fixed independently of what one might choose them to be. Who fixes the norms of rationality?

The faculty of reason performs three intellectual functions, namely, cognition (understanding), feeling, and judgment, from which flow respectively: knowledge, morality, and aesthetics. To discharge its responsibility, reason requires certain a priori concepts which Kant calls 'category'. That is to say, reason must possess certain judgments in advance in order to comprehend this world. Put another way, reason needs a platform whereupon it stands and works. A source of disenchantment with the Enlightenment rests on the fact that it expected too much from reason. In the language of Enlightenment, rationality enjoins that all our actions, objectives, values and priorities be subjected to reason's scrutiny. As if we have to step back from all our historically accumulated traditions and values so that reason can evaluate them all from a distance of detachment. But reason cannot work with a bare hand, and man cannot leave behind all his historically determined moral convictions, on pain of losing his moral bearings. Reason, in the philosophy of Enlightenment, requires that at least once in our life we stand back from the beliefs we already have and examine their credentials. But this logic, pushed further, implies that beliefs serving to justify other beliefs must themselves be justified, getting us entangled in circular reasoning or endless regression.

We can instead regard our moral convictions as necessarily rooted not in reason as such, but rather in one or several traditions of moral thought and practice that are historically contingent, and that we can elaborate or even change in part, but never completely set aside for looking at them from an absolutely detached point of view.

The biological analogy could be illuminating. Mutation of a single gene can take place within a relatively short period, spreading ripple effects all over the body. A series of favorable mutations, through the process of natural selection, can give rise to a new species. We can possibly replicate such evolution in the realm of beliefs as well. Beliefs have indeed evolved in the course of history. The effects of a partial modification in one belief can be ascertained by cross-section or time-series analysis of observed data drawn from the experience of several communities who hold that belief and several others who don't. Then the faculty of reason will be assigned the task of evaluating those effects in the metric of a given criterion. Should reason approve, the contemplated small change in the belief will be deliberately introduced. What we thus get at the end is a rational belief, rational by virtue of the assent of reason.

Here is an example. For some communities in India the day of *Akshay Tritiya* is auspicious for marriage or other ventures like purchase of gold jewelry or investment in a new project. This tradition can be regarded as a hypothesis to be tested with observed data. There are other communities which do not have such a faith. How do they fare in marriage or investment? Such comparative studies would enable us to evaluate the benefit or loss involved in the *Akshay Tritiya* observance.

In mathematical language, the model can be expressed as follows. Suppose that our wellbeing is a function of several beliefs. Estimating the function as such is impossible. But we can possibly find out the effect of a small change in one belief at a time, that is, the first derivative of the wellbeing function with reference to one belief at a time can be estimated. The value of the first derivative will be scrutinized by reason, which will then make recommendation whether the change is worth doing.³

In India, several attempts had been made to reform people's beliefs. We can distinguish between two scales of doing it: macroscopic, and microscopic. Rammohun Roy (1772-1833) and Iswar Chandra Vidyasagar (1820-1891) were great leaders of the Bengal Renaissance. In his attempted synthesis of the best thought of the West and the East, Rammohun was engaged in a macroscopic reform in that it involves the entire society, while in his fight against 'sati' (wife's immolation at husband's pyre) he was working at a microscopic level, touching primarily one part of the society. Iswar Chandra Vidyasagar concentrated on the microscopic field when he raised his powerful voice against child marriage and polygamy, and he campaigned for widow-marriage. Macroscopic reforms are possibly better done by using the thinking-hardware, microscopic reforms may be better served by adopting the rational belief approach. □□

References:

1. Claude Le'vi Strauss : *Structural Anthropology*;
2. Ranjit Sau: *The Foundation of Democracy in India*;
3. Mathematical model of rational belief is as follows. Suppose our wellbeing depends upon a set of beliefs. In symbol, $y = f(a, b, c \dots x)$, where y is wellbeing; $a, b, c \dots x$ are beliefs; and f denotes a function representing its relationship with the variables. It is hard to know function $f(\dots)$ as a whole, it is easier to estimate the first derivative of y with reference to, say, x , which measures the incremental benefit due to a unit change in belief x . Reason is called upon to judge whether to approve the change in x . The choice being recommended by reason, we have a rational belief.