CHAPTER 1

INTRODUCTION
1. INTRODUCTION

Science and Superstition are two aspects of our individual and social life. Science (Latin, *scire* meaning 'to know') is a form of consciousness and represents a historically developed system of reasoned knowledge, truth of which can be developed and made more precise during the course of society's practical experiences. Science is as old as human being on earth. It is linked to every point with other social activities and has undergone many changes over the whole range of human history that no adequate definition, covering all aspects, could be made of it. It is a unique and inseparable process of social evolution and the idea of a one and only one definition does not strictly apply (Bernal 1994a). Science is a social product and the material situation of the life of the people living in a particular historical era and geographical environment form the foundation of science and affects and moulds society and vice versa. Any development in science in one corner of the globe, with a very little time lag start influencing the intelligentsia, the economy, life style, structure of thinking and culture in other parts of the world (Barman 1981a and Kosambi 1994). Nehru Centre of Bombay has described science as an attitude of mind that calls for a particular outlook and behaviour in the Document of Scientific Temper. In the document science has been regarded as having universal applicability which has to permeate through our society as the dominant value system influencing the way we think and approach our problems—political, social, economic, cultural and educational. The method of science provides a viable method of acquiring knowledge and any human problem can be understood and solved in terms of knowledge gained through the application of the methods of science. The fullest use of the methods of science in everyday life and in every aspects of human endeavour, from ethics to economics is essential (Pathak 1986).

The philosophers have questioned and tried to define the nature of science. The question of validity of knowledge has been examined to determine the scientific method. Initially Victorian philosopher Francis Beckon described inductive method as scientific method, the law formulation and verification followed. Later on, dependence on induction exclusively was supplemented by deduction. Popper (1934) criticized the concept of verification and suggested an alternative method of falsification. 'Popper’s sceptical perception that science could never be sure it had obtained truth, was underlined by Kuhn’s (1962) idea that science
proceeds through a series of revolutions which successfully destroyed old theories (paradigm) replacing them with new one. New theories from radical discontinuities involving new perceptions’ (Porter and Hendry 1999). Thus science has been also proved as not absolute knowledge but relativistic knowledge. However, there are defenders of scientific objectivism, some of them are Lakatos (1986) and Laudan (1978). They argued that science has the strength to distinguish truth and error through experimental testing. Science encompasses a cumulative growth of a system of knowledge over time in which only useful features are retained, based on rejection or confirmation of testable knowledge and has certain built-in self-correcting features namely experimentation, corroboration and falsification. Superstition does not have the goal or the mechanism to allow the accumulation of knowledge that builds on the past and does not stand on the shoulders of their predecessors in the same manner as scientists (Shermer 2002).

Superstition (Latin, *superstitio*, meaning ‘outliving or surviving’) is a kind of cultural and personal belief, half-belief, action or practice for which there appears to be no rational substance and is inconsistent with the degree of enlightenment reached by the community to which one belongs (Encyclopedia Britannica 2005a). Human being, in various stages of individual and societal development and life cycle, from birth to death, were always associated with some protective devices. These devices were supposed to be attracting favourable influences and warding off unfavourable ones, vestiges of which are still remaining in the form of superstition while the original ceremony from which they sprang had died. Superstition is a form of personal magic used for coming to terms with the unknown. By false analogy- a particular course of action, having past successful records, with some objects worn or action carried out, accorded a kind of talismanic quality in case of positive superstition. The object or action is then used again expecting an identical result at an other time at will. On the other hand, negative superstitions are the avoidance of certain acts or actions to prevent some undesired consequences (Maple 1985a and Wiseman and Watt 2004). Superstition can be regarded as those events or probable events along with customs and rituals observed accordingly that are related or thought to be related to this world or afterworld well-being of man for which impersonal explanations, based on imaginative cause-effect relationships are made (Choudhury 1993). Superstitions are the beliefs, practices, concepts and the actions taken accordingly, which are accepted to be true
in society and are above logic of cause-effect. The actions taken out of superstitious beliefs and practices usually exert great influences in individual and social life often determining the course of future development. New forms of superstitions are taking place to fill up the vacant place of defunct superstitions depending upon society, time and space and on various social, economic, geographical, cultural and political factors as if these are very important part of all cultures and civilizations (Mahanta 2003a and Newport and Strausberg 2001).

Both science and superstition go together in individual and social life in our society and influencing it in varying degrees. One tries to grasp, explain and even control the happenings in and around us by relating them through cause-effect relationship and the other by supernatural or occult practices.

1.1 MEANING AND CONCEPT OF SCIENCE

The Oxford English Dictionary (1933a), defines 'science' as a branch of study which is concerned either with a connected body of demonstrated truths or with observed facts systematically classified and more or less colligated by being brought under general laws, and which includes trustworthy methods for the discovery of new truth within its own domain.

According to The Webster's New Twentieth Century Dictionary of the English Language (1960a), 'science' is a systematic knowledge derived from observation, study and experimentation carried on in order to determine the nature or principles of what is being studied.

'Science' is knowledge, which can be made into a system and which usually, depends on seeing and testing facts and stating general natural laws (The Longman Dictionary of Contemporary English 1986a).

For the purpose of present study, science has been considered as a historically developed system of reasoned knowledge derived from systematic analysis, observation, experimentation and testing of the available information in arriving at neutral decision and general laws, leaving aside personal emotions, feelings and aspirations. Science, implicit in the techniques hence inconceivable without it (Science and Technology Policy Resolution 2003), will be considered as intellectual production of man during the long journey of
material production of subsistence and changing its form with time to cope with the need of the changing society. The classical dictum of Marx (1970) that if material production is not understood in its specific historical form, it is not possible to grasp the nature of corresponding intellectual production also the reciprocal action between the two will have to be constantly borne in mind.

1.2 MEANING AND CONCEPT OF SUPERSTITION

The Oxford English Dictionary (1933b), defines 'superstition' as a religious belief or practice founded upon fear or ignorance; irrational or unfounded belief in general.

According to The Webster's New Twentieth Century Dictionary of the English Language (1960b), 'superstition' is any belief or attitude that is inconsistent with the known laws of science or with what is generally considered in the particular society as true and rational; especially, such a belief in charms, omens the supernatural etc. and any action or practice based on such a belief or attitude.

The Longman Dictionary of Contemporary English (1986b) defines 'superstition' as a belief, which is not based on reason or fact but on old ideas about luck, magic etc.

'Superstition' is belief, half-belief or practice for which there appears to be no rational substance, groundless in them and inconsistent with the degree of enlightenment reached by the community to which one belongs. Superstitions may be classified roughly as religious, cultural and personal. Every religious system tends to accumulate superstitions as peripheral beliefs often one person's religion is another one's superstition. Superstitions that belong to cultural traditions are enormous in warding off ills, bringing good, foretelling the future and healing or preventing sickness or accident have been found in most periods of history and in most parts of the world. Personal superstitions are of various kinds and even in so called modern times there are few people who would not, if pressed admit to cherishing one or the other irrational beliefs or superstitions (Encyclopedia Britannica 2005b).

The general or abstract term 'superstition' signifies the disposition to attribute occurrences to supernatural or occult influences, and to direct conduct with a view to avoiding mischief or obtaining advantages which such influences are supposed to produce (The Encyclopedia of Religion and Ethics 1967).
'Superstitions' are however, but beliefs of which there is no longer a wholehearted acceptance. They are practices that are followed without conviction, but with an uneasy feeling that it will do no harm to carry them out, if by chance we thus get on the good side of powers whose existence we may at times doubt (Herskovits 1969). A Dictionary of English Folklore (2000) asserted that popular authors and general public consider superstitions to exist date back from thousands of years which are direct survivals of the attempts by primitive humans to explain and control their environment.

Superstition, for the purpose of present study, will be regarded as those events or probable events and the practice, customs and rituals observed accordingly though inconsistent with the degree of enlightenment reached by the community to which one belongs. Concepts, beliefs and practices accepted in society to be true and necessary but cannot be attained or established through the normal process of reasoning and cause-effect at the time in question will be considered as superstition.

1.3 ORIGINS, DEVELOPMENT AND SOCIOLOGICL BASIS OF SCIENCE

Man is the last great species to emerge in the process of evolution. They were speechless, occupied land habitats, battled themselves and with fellow animals for acorn or for their lairs with their claws, fists and lastly with arms and has succeeded in surviving and multiplying in their environment forming continuing societies with a material culture. Such societies acquired better methods for collecting food and protection than could be achieved by isolated individuals (Bernal 1994b). The means of preserving, handling and imitating of these methods ensures the coherence of society and handing over of its accumulated culture to later generations. This was possible chiefly by the discovery and invention and subsequent improvement of his artificial and detachable equipments that can be used and discarded at will. Man becomes more efficient in interacting to external environment in drawing his subsistence and escaping from absurdities mainly for its equipments (Forbes 1971). Equipments, in case of animals, are different parts of their own bodies in different animals, adapted for performing a limited number of operations in a particular environment against man's infinite number of operations. This is adding new scope to the capacities of naked bodies in almost any environment. This was mainly possible after man's forefeet
developed into delicate instrument, capable of performing innumerable variety of functions with accurate movements, along with eyes, sense organs, nervous system and exceptionally big and complicated brain. Simplest tools made out of a stone or a broken bough was the result of several trials and errors. Skill to make these tools and equipments of labour has been acquired by observations, recollections and experiments generation wise in an ascending order. Gradual evolution in the structure of larynx, tongue, expansive human brain and other organs made them capable of emitting sounds bearing conventional meanings by some sort of tactic agreement among the members of the group, thus starting communication. Subsequent formation of language, by gesture and voice, thus make possible the transmission of experiences of social heritage and tradition generation to generation. The ability to seek solution of the problems, without going through a physical process of trial and error with hands, lead to the development of reasoning, thinking and subsequently ideas. Man even seems to be impelled to far more strenuous and sustained actions in interacting with changed environment both with hand and head (Childe 1978). Thus man has been acquiring more and more experiences in the long run from savagery to civilization through barbarism (Engels 1948). A few groups in the jungles of Malaya, Central and South Africa, Australia and New Zealand are still found in these stages of development. Surplus production of foodstuffs in the alluvial valleys of Nile, Tigris-Euphrates and Indus along with subsequent use of copper, bronze and lastly iron led to the formation of civilized societies (Morgan 1982).

Science has its origin in various techniques, ideas, arts, crafts, implements, activities and cultural life of the time by which man has succeeded in surviving in his environment since remote past. Science does not appear first in recognizable form and therefore difficult to study its origin. It is necessary to search out its hidden sources in the histories of human arts, institutions, magic, religion and philosophy. The expression of science initially was verbal and the mainstream flows from the techniques of primitive man adopted in their day-to-day life both individually and in groups (Farrington 1944, Sarma 1993 and Riggs and Riggs 2005).

We could discern the seeds of Biology in fruit gathering, game hunting and later in agriculture; the seeds of Physics and Mechanics in the tools of stone, copper, bronze, and iron, bow and sling, hammer, mining and melting, weapons and other war machines; the
seeds of Chemistry in fire, cookery, prepared skin, clothes, baking, brewing, brick, pottery and in drugs and dyes; the seeds of Social Science in small social groups, hunting, burial and fertility rites, class societies, city states, war, craftsman, trader and in social struggles, Astronomy in calendar making and calculation of the exact time of rituals and Mathematics in numbers, geometric designs, accounts and in weights and measures (Bernal 1994c and Barman 2003).

Civilisation and science, as a whole, through an unbroken chain of traditions and customs of our ancestors, grown up from material techniques and social institutions of the distant past of Palaeolithic age. The interesting debate about the revolution of heavenly bodies without knowledge of mythological origin of these ideas, for example, marking the beginning of modern science is unintelligible. Agriculture, weaving, and pottery of Neolithic cave culture initiates the crucial invention of city states that made the technical, intellectual and economic development and astronomy, medicine and chemistry as distinguishable areas of knowledge. The discovery of iron, probably a by-product of gold making, somewhere in Caucasus by the tribe Chalybes in the 1500 B.C., results in the movement of effective foci of ancient civilization to the peripheral areas of the nearer barbarians in 1000 B.C. Iron Age is marked by the use of the cheap metal iron, invention of money, alphabet and philosophy, preparing the ground for rapid development and proliferation of rational science by the Greeks out of technical experience of the older empires.

In Greek science, First Ionian phase of the 6th century BC, is associated with the legendary figures of Thales, Pythagoras and other nature philosophers who in a most materialistic way explained the world. Second Athenian phase from 480 to 330 BC, was the period of peak achievement of Greek science, culture and wisdom. Socrates, Plato and Aristotle of these periods made philosophy to give more importance in explaining the nature of man and his social responsibilities. The third Alexandrian or Hellenistic phase of 330 to 220 BC was the most important for the formation of science as a coherent whole. Independent city-states decayed and the empire of Alexander spread from Egypt to Afghanistan even influencing India and China in the Far East. The museum at Alexandria was the first state supported research institute in human history and the result is the great development of mechanics, mathematics, and astronomy by Euclid, Archimedes,
Hipparchus, Ptolemy and Strata. The fourth and the last phase since the coming of the Romans in the mid of 2nd century BC, without any originality, was regarded only as the bridge between classical and the later science.

In the Hellenic and Roman Period, civilization and the idea of Natural Science were spread all the way from the Atlantic to the Hindukush. In the east, central Asia, China and India all felt its influence blending with native cultures and in west learning to tame the barbarians of Europe. Astronomy and Mathematics of classical culture were most lasting.  

Between the 3rd and 7th century, after the fall of Roman Empire, the triumph of Christianity was the dominant intellectual life and confined to churchmen. Case after case right down to the controversy on Darwinian evolution, the acceptance of obvious solution has been held up for years because they could not be explained with genesis. The centre of science was shifted to Persia, Syria and India during the 5th, 6th and 7th century with great cultural advance. In India also Science was intimately linked with the magico-religious activities of determining the right time for Vedic rituals, construction of sacrificial altar, dissection of scarified animal to astronomy, geometry and anatomy respectively. Aryabhata(born 476 AD), Varahamihira(born 505 AD), Brahmagupta(born 598 AD) and Bhaskaracharya in the 12th century made spectacular contribution to mathematics and astronomical studies.

Ayurveda or medicine was extensively studied and ‘Carak-samhita’, Susrata-samhita and Astanga-samhita were excellent compilations. Rasayana or alchemy was also a part of Ayurveda and Nagarjuna was the most distinguished alchemist having ‘Rasaratnakara’, ‘Yogasataka’ and ‘Kaksaputa-tantra’ to his credit. Physics, Botany and Zoology were also extensively studied in India (Barman 1981b). Discovery of ‘zero’, use of geometric theorems before Christ, the learning centres Takshasila, Vikramasila and Nalanda were the Indian achievement towards the development of Science. After the museum of Alexandria, Nalandia was the oldest University in the world. In Assam, Arunodaya, Jonaki and Awahan, in the nineteenth century, published different items on scientific activities and discoveries (Mazumder 1995). Before the advent of British, mathematics, astronomy and medicine were also studied in Assam. Bakul Kayastha and Kaviratna Dwija in mathematics, Damodara Vipra, Pitamber Siddhantavagish, Vangshibadan Sarma, Mathuradas Mahadev Sarma in astrology and Sarangadhara, Kalicharan Sarma, Ananga Kaviraj in medicine made
remarkable contributions. Old temples, forts and palaces depict the glorious architectural achievement of ancient Assam. Other works like images of Vishnu and other daities, gunpowder making, brass-work, pottery, weaving, separation of gold dust from Subansiri River etc. clearly shows various scientific and technical cultivations in ancient Assam in sculpture, arts and crafts since time immemorial (Barman 2006 and Kalita 2007). The mission of Mohammed between 622 to 632, swept away the old tribal gods replacing them by one god Allah and Science was encouraged by the Islamic scholars equally to the early days of the museum at Alexandria, flourishing in the 9th, 10th and 11th century using the ancient knowledge of Mesopotamia, India and China.

Feudal economy during the 11th to 14th century developed fully in Europe with corresponding art and knowledge. The sum total of achievement in natural science were the Notes on Natural History and Minerals by St. Albert, on birds by Emperor Frederick II, on optics by Dietrich and an account of rainbow. Horse-collar, the clock, the compass, the stem port rudder, gunpowder, paper and printing come from east, mostly from China. Greater trade and improved techniques led to a market economy, which is a decisive factor in creating a new, progressive and experimental science, and the stage was full set for the renaissance and industrial revolution in Western Europe. The transition from Feudalism to Capitalism as the leading method of production, where techniques and science played a decisive role, took place. This technical, economic and scientific phenomenon is a unique one and first became the prevailing form of economy of the 15th century. It amounted to renaissance and science revolution in which the assumption in science inherited from the Greeks and canonized by the religious authorities of Islam and Christians were overthrown and a new quantitative, indefinitely extended secular view of the world took place. The material needs of development led further advancement in mining, warfare, navigation, mechanics and astronomy for a practical help where it was necessary (Bernal 1994d).

First phase of Scientific Revolution, roughly from 1440 to 1540, was designated as the Renaissance and as the handiwork of a small group and conscious group of scholars, artists who strove to create a outlook in reading the texts of classical antiquity not as a long chain of tradition but reading the texts directly by themselves, so Democritious and Archimedes also with Plato and Aristotle. Surplus production due to technical improvement enormously improved shipping and navigation to open cheap and safe route to a vast new market.
Money had become more important and every effort for more and more money was made, even magic acquired a new interest as a means to wealth and power. As a result the position of the technicians and artists enhanced and new devices in techniques of classical antiquity took place. A solar system with sun at the centre by Copernicus and complete anatomy of human body by Vesalius in the year 1543 pave the way, at the outset, for a society which want to learn by seeing and experiencing itself. Great many other workers in diversified fields are Leonardo da Vinci, Columbus and Paracelsus. Renaissance marked an era of decisive achievement of science providing a secure and growing field of application regarding Astronomy, Navigation, Mechanics and Dynamics as the most vital, active and profitable enterprise of trade and war, later to manufacture, agriculture and medicine.

The second phase of scientific revolution about 1540 to 1650 was the age of inconclusive wars of religions in France and Germany. Copernican explanation of solar system was firmly established by Galileo despite condemnation by the church is the most remarkable achievement of this phase. Telescope and microscope for observing nature are two great invention of this period. Giornando Bruno, Tycho Brahe, Kepler, Gilbert Harvey, Descartes and Bacon of this period through their remarkable contributions raised the status of experimental science to a very high esteem. The third phase of 1650 to 1690, marked by the rapid growth of science with its spread to new fields and is the age of Boyle, Hooke, Huygen and Newton on which rest of science could confidently be built. Knowledge of natural laws was seen to be the key to the harnessing of powers of nature in the service of man (Bernal 1994e).

The great formative centuries of modern world are the 18th and 19th centuries in which intellectual formulations of science, techniques in industry, economic forms and political domination of capitalism and great transformation of the means of production leading to the Industrial Revolution. The later years of 19th century were marked by the great synthesis of Faraday, Maxwell, Darwin and Pasteur. In the last part of the 20th century and the beginning years of 21st century, the enterprise of science has been directly involved in the major academic, economic, industrial and military development. At every turn of the events, economic and social forces determine the general direction and speed of scientific discoveries, which in turn affect and mould socio-economic and even political events.
Science keeps on making better and better approximations of the truth by searching for causes and their effects. Every scientific discovery and inventions of any importance is absorbed into the body of human scientific knowledge to be used thereafter (Kosambi 1992). These inventions made possible new class structure in society between mental and manual labour. Chiefs and priests planned and organized productions. Artisans and cultivators were the manual labourers. With the expansion of trade, a new class of merchants arose. In time this division of labour hardened into division of classes in society. Merchants were interested in further development of commodity production but the ruling class resisted them, which were too powerful to be overthrown. This results in marked decline in the rate of technical progress and intentional creation and elaboration of different tactics, even the idea of god and religious worship, took place to safeguard vested interest of the kings and priests (Thomson 1977). The tendency to turn away from nature fully agrees with the material conditions that enable them to philosophise. These are conditions in which manual workers or direct producers were shorn of all prestige and privileges. The urban revolution, made possible by science, was exploited by superstitions. The main beneficiaries from the achievements of farmers and artisans were priests and kings (Childe 1958). The tools and techniques by which nature can be interrogated belong to farmers and artisans. Therefore, when they recede to the background, the growing stock of their experience and understanding ceases to have any vital significance for the kings, priests, nobles and thinkers subsisting on royal gifts. The essential demand of the counter ideology—its open distaste for direct knowledge, fully coheres with the socio-political conditions, which it intends to safeguard (Chhattopadhyaya 1979). The empty hypotheses, emanated from medical amateurs who had continued to use their heads, giving up using their hands, began to threaten the science of medicine from the 5th century B.C. onwards, represented primarily not an aberration of the individual mind, but the emergence of a new class in society—the leisured class. For them theory bore little or no relation to practice. The head was independent of hand. They succeeded in transforming medicine from a positive science since Carak, Susrut and Hippocratis into a speculative philosophy. Plato in Greece, for the safety of slave society, employed his full effort and energy in creating mystics and myths. He persuaded that we all are brothers and sisters but god had mixed some gold to some of us who are fit to rule, silver in the auxiliaries and iron and bronze in the farmers and other
artisans. He asked to adopt any device to get the community believe it, though may be difficult for the first generation perhaps their sons and descendants easily. In his Sophist Plato described the controversy between the Ionian Philosophers who initiated the tradition of conscious rationalist science in Greece and the pious believers in superstition as a battle between Giants and Gods. Marx and Engels (1965) observed that in the developed theory of slavery, the slave was not regarded as a rational being. The master alone was capable of reason; the slave might hold correct opinion if he strictly followed the direction of his master. In India Manu and others tried their best to establish the in born supremacy of the ruling class and the priests over the rest by adopting various tactics (Chattopadhyaya 1985).

Centres of older river valley civilizations lost their progressive and innovative potential to a great extent by 3000 B.C. due to increased exploitation by the kings and priests. No advancement in the techniques of production was done. Innovative competencies of the actual manual workers and producers not encouraged thereby shoring off them from all prestige and privileges. Their impoverishment lowered the demand for commodities resulting corresponding deterioration of the condition of the merchants and artisans accordingly. In this atmosphere of having no incentive for science, it lost the essential quality of doing new things and inquiring into Nature. Their knowledge not being used for acquiring further knowledge is sure to decay and die automatically as has happened to the great library at Alexandria where very few need to read the volumes and as time passed, no one can understand them leading to decay unread in selves and later burning to heat the public-bath water (Bernal 1994f). Art and literature buried in an increasingly complex mass of rituals that could appropriately be called superstition. This result in marked decline in the rate of technical progress and intentional creation and elaboration of the idea of god, religious worship, supernatural fear, magic and rituals took place to safeguard the vested interest and supremacy of the ruling class and priests.

In India stagnation of science for a long period after 12th century is a complex sociological question and cannot be ascribed to the failure of individual talents or non-appearance of scientific geniuses (Thygarajan 1995). Emphasis on learning basic ideas through a routine way, obeying and respecting even a silly tradition, secret meanings expounded by a guru and world denying metaphysics, obscurantism, caste hierarchy and religious orthodoxy and the over all socio-economic structure of medieval India together put
a heavy load on Indian science. Sarma S (2004 and 2006) has clearly elaborated the retrogressive role of caste hierarchy in the formation of rational bend of mind among the Indians. Barman (1981c) referring Kosambi (1972), Farrington (1936), Ray (1956), Bose (1894), Weber (1970) and a visiting scientist Al Beruni (Sachu 1964a) elaborately explained caste hierarchy and influence of religion to be the main two causes for stunted scientific growth in India causing very little original works.

1.4 ORIGIN AND SOCIOLOGICAL BASIS OF SUPERSTITION

Among primitive people lives were full of uncertainties and different protective devices were taken to save themselves from their fellow wild animals, rival groups, absurdities of nature and all other unseen forces. So, various stages of individual and societal development and life cycle, from birth to death, were always associated with some protective devices. These devices, according to evolutionary scholars, were supposed to be attracting favourable influences and warding off unfavourable ones, vestiges of which are still remaining in the form of superstition while the original ceremony from which they sprang had died. Many of these superstitions are apparently outward manifestations of deeply seated anxieties and uncertainties and are regarded as relatively unexplored territories. These imply unquestioning assumption of a super power external to man and a permanent trait of mind. At the root of every type of superstitions there lies a belief in magic and offer a comforting assurance when one becomes afraid. Physical contact with a piece of magically charged wood, horseshoes, metal charm, bracelet and hundred others had found a ready acceptance as a luck-bringer. This concept is communicated to the new generation at their very childhood mainly by their mother or grandmother and occasionally by father. Luck-bringer charms are always kept secret and at the time of crisis made their appearance but the protective charms were always openly displayed to warn off evil spirits (Maple 1985b). Sigmund Freud studied superstition as an evidence of his theory of psychoanalysis (Dorson 1972). Yoder (1972) cites way-land-hand to point out ‘superstition is not the preserve of the unlettered only, but is a state or a way of looking at things that may be fall even the most sophisticated members of society. Professional people of all kinds, no less than tradesmen, are prone to many of the popular conceits and mental errors to which, for
want of formal education, members of humbler have fallen heir'. Yoder further observed that many superstitions have been found to be folk medicine.

The sociological basis and role of superstition depend largely on the time, place and developmental stage of society in question. The days of food gathering, hunting and food producing were full of uncertainties; it even increased, as agriculture was totally dependent on nature. In addition to this, fear from natural calamities and wild beasts forced primitive mind to adopt devices to acquire desired results in one hand and keep away sense of fear on the other: the former gave rise to positive magic and the latter negative magic, the root cause of many superstitions (Frazer 1993). Various socio-economic, political and anthropological factors are operating behind each superstition. New types of superstition are filling up the vacant places of defunct superstition and have been playing very important part of all culture and civilization world over.

It is alleged that honest and harmless looking superstitions may be helpful in creating unquestioning attitude among common people leading to injustice, oppression, exploitation on various sections of society centering on economic activities. Societies with uneven economic, educational and industrial development are alluvial land for the growth and spread of superstitions rather easily and some politicians and ruling class agents exploit the situation to their advantage. Instead of educating the people in progressive ideology, the leaders of political parties are seemed to surrender to retrograde pressures from different forces thereby giving legitimacy to superstition and obscurantism (Ghosh 2004 and Gora 1978). Caste and religion are powerful superstitions in India and partition and post-partition communal violence in the country was the result of differences in religious affiliation and sentiments, which have after effects till date. V P Singh Government in India fell out of the events having deep roots in the caste system. Plato, Isocartes, Polybius and Kautilya were jubilant to discover superstition to be one of the most powerful weapons to establish supremacy of the ruling class over the common people since its advent in society (Mahanta 2003b). Many other political events in the world and riots in India have their roots in some superstitions (Rajkhowa 1973a).

Science has a prolonged conflict with the religious authority and other superstitious beliefs still do so in present time in one form or the other. It is a conflict between the authority and observation and most notable in the dispute as to whether the earth or the sun
is in the centre of solar system. In Greece, Ptolemic orthodox theory kept earth in the centre and the sun, moon and planets revolve round it for thousands of years. Copernicus in 1543 on his great work ‘On the Revolutions of the Heavenly Bodies’ described two-fold motion of earth - one on its own axis once a day and the other round the sun once a year. But he did his best to avoid conflict by delaying his publication, dedicating his book to Pope and saying his findings mere as a hypothesis thereby making himself able to escape Inquisition. It was Galileo Galilei in 1632 on his great book ‘Dialogues on the two Greatest Systems of the World’ strongly argued Copernicus and was forced to face sterner action by the Inquisition. He was forced to recite publicly on his knees as dictated and home imprisoned till the last hour. This was after 32 years of burning Giordano Bruno alive after 7 years of imprisonment on similar ground in the year 1600 (Russell 1935 and Sarma 2000). After 360 years Pope of Vatican City confessed, after inquiring for 12 years by a committee, that the decision against Galileo in 1633 was wrong as reported in The Economic Times in 1992 (Majumdar 1997). Socrates, instead of showing any sign of compromise, took the cup of poison cheerfully and drank it. Some others were forced to leave their country and other punishments of varying degrees and nature for going against the authority and religious institutions in different countries of the world in different times. Perhaps some religious traditions are more in touch with cosmic and human realities and are more compatible with empirical science than others (Budenholzer 2001). In India the growing resistance to natural science by the priests and others become most conspicuous in the case of the medical science as the therapeutic technique was taking the prodigious step from magic to rationalist medicine. Surgeons and doctors tried their best to save their science, of course, by paying heavy ransom to anti-science force. That is why the basic works on medicine, the Carak-Samhita and Susrat-Samhita have been in the quaint from of astute science intermingled with various superstitions. These superstitions are to be understood clearly by identifying their nature and sources so that their present form of crippling natural science may be booked. The force is still working to cripple natural science by adopting means whatever current situation demand. Some conscious scientists declare war of different degrees against anti-science and others were not aware of it because they feel generally a sense of inviolability about the old superstitions as these are there from generations, from our early childhood to youth, so to say along with our mother’s milk, to maturity as sanctioned by the
scriptures. Century-old superstitions down to us with an alleged scriptural sanction acquire an aura about itself that questioning it requires a strong skeptical bend of thinking. Questioning spirit always is facing attack by some power-crazy political groups and others who are sensing profitability in cultivating superstitious beliefs and practices among the masses for their vested interest of different forms and nature. This includes some people even who earn their bread by working as scientist, science teacher, science communicator, science populariser, science activists etc. A remarkable visiting scientist Alberuni from Persia to India in 1017 AD, uninhibited by the limitation that stultify the Indian mind, expressed certain palpable absurdities caused by anti-science about the situation of science in India which generally seem to elude the Indian mind. He noticed that when ignorant crowd get a desired effect by accident or something else at which they had aimed; and when some preconcerted tricks of the priests brought into connection with this by throwing an air of mystery about the subject, vastly increases the darkness already exists suppressing their intelligence. They are even ready to satisfy those figures of idols of good luck by shedding their own blood and mutilating their own bodies (Sachu 1964b). Absurd stories of the practitioners of the pills of immortality or of making gold astonished him. Alberuni also noticed that in Brihatsamhita, Varahmihira clearly described the causes of solar eclipse for the moon covering and hiding the sun from us and lunar eclipse for entering the moon in the shadow of the earth against religo-mythological belief that a demon Rahu, a mere head has no function other than temporarily gobbling up the sun and the moon to cause eclipse. But to satisfy common people's belief Varahmihira told that Rahu is near the spot of the eclipse searching for his portion from the offerings made by the Brahmmins to the fire at the moment of eclipse. Varahmihira, as Alberuni observed, could not outgrow the spell of the ancient superstition because of the Brahmincal or scriptural sanction for it. Later Indian scholars also conveniently ignored Varahmihira's comment on Rahu so that priests do not feel uncomfortable with them (Chhatopadhyaya 1996a).

In India, the duties, rights, functions, and aspirations of an individual are automatically determined by his birth as a member of one of the four classes, the Brahmin, the Kshatriya, the Vaishya and the Sudra. Like their counterpart abroad, the Indian lawgivers also argued desirability of superstitions and hence suppression of science in maintaining the above mentioned four varna-norm social structures considered most desirable by them. To ensure
implicit obedience of the members of society and to advance the cause of corporate life, unfortunately, superstition was regarded as beneficial against reason (Rajkhowa 1973b). This sociological factor, due to class and group interest operating against science still operating in modern times assuming new forms (Deka and Bardaloi 2003, Mahanta 2006 and Sarma 2007). Since the emergence of modern science, roughly from the times of Galileo, Bacon and Descartes, a new capitalist class sensing overwhelming profitability, extending political and financial support to the cause of science- a situation created by science's own right. The prospect for profit and more profit promised by science led the capitalist class in modern time irreparably destroying and damaging socio-ecological balance and sustainable development threatening the existence of the planet earth even. This misuse of the prospects of science wanting to frustrate the fundamental aspirations of science is still in operation, like the priest class in ancient times.

1.5 PRESENT STUDY

The influence of science varies in its form and nature. These are dispelling of many unfounded traditional beliefs and practices and introducing new techniques in industry and war and bringing profound changes in social organizations leading to corresponding political changes. It is influencing the way we think and approach our problems of all types, from ethics to economics, in all the human societies of the world since our savage ancestors. It is reciprocal with the influence of superstition in all the societies but in different degrees. Superstitious fears are likely to arise in anyone and every one of us irrespective of social class or ethnicity or nationality-who feels threatened by forces lying beyond the range of his power and the form of a particular superstition is determined by the degree of uncertainty feeling along with the environmental and social factors. A particular course of action carried out, by false analogy, which has proved successful in the past, is accorded a kind of talismanic quality and used again or repeated expecting a similar favourable result at another time in case of positive superstition. In negative superstition, avoidance of a certain act or action with the object of preventing undesired contingencies took place from a similar false association of ideas (Maple 1985c).
A man with scientific knowledge and attitude would not like to take for granted and believe in irrational beliefs and superstition that an individual will fail in his task and will feel unsuccessful if a cat crossed his way, or he himself or somebody else sneezed. While religious and cultural superstitions are shared by a community and hence are accessible to investigation, personal superstitions are not easily accessible for investigation and understanding.

In recent years Babas, Peers and Godmen have made a significant headway in influencing the society. People easily fall prey to their antics and magical power. Even some of the stalwarts of politicians are following the dictates of Godmen in determining right moment for filing nomination, swearing in ceremony, starting and inauguration of new projects, in some decision making processes and even in launching of satellites (Gohain 1997). ‘Rain Yanjna’ and other occult practices are being performed at the behest of some officials, engineers and technocrats of the Department of Science and Technology, Government of India (Sarma 1997). Minister of Human Resource Development, Government of India does not hesitate to suggest occult measures to pregnant women who desire male child at his Technology Day lecture at New Delhi (Choudhury 2002). Cowan (1968) reported that how even people in the western society believe on the power of the magicians in diminishing illness by gradually removing the letters from a line ABRACADARBA from a pendent given to a patient. Gilliant (2007) referring Usher Gary, one of the longtime White House employees of United States of America, revealed that most of the recent Presidents feel the presence of their predecessors and the current administration function in the shadow of the leaders who has gone before them. Several other staff members also admitted that a few shadows move about turn off lights, admonish flower pickers and shut the doors. Anthropologists and Psychoanalysts rely heavily on Freudian interpretation in explaining superstitions. Belief in ‘auspicious time’ is all pervasive in our country which might have led an apex body like University Grants Commission (UGC) to make an attempt to introduce astrology and palmistry in Indian Universities as a separate course of science subject with ‘ostensible’ purpose of benefiting students, teachers, professionals like doctors, architects, marketing, financial, economic and political analysts in accurately predicting the future. This is nothing but providing a license to practise superstition in public (Balaram 2000 and Pal 2001). In the Document of
Scientific Temper, published by Nehru Centre, Bombay, some of the leading scientists and intellectuals of India expressed grave concern over a phenomenal growth of superstitious beliefs and obscurantist practices.

We are also witnessing in our society from our childhood that most of the people from all walks of life and of all ages, sex, education, religion, and occupation are observing one or the other superstitious practices on different occasions for attracting favourable influences and warding off unfavourable ones in spite of the spectacular advancements made in science and technology. Superstitions about sneezing, breaking of mirror, walking under a ladder, lucky objects, throbbing of the eyes and certain diseases exist in most of the societies. Superstitions about numbers, colours, food, metals, and precious - semiprecious stones are common. Most of these are personal superstitions, which depend on the fancy of an individual. Colours, numbers, stones and zodiac signs are supposed to influence human destiny. An amulet is an object, which is either carried or worn or placed in the house as a protection against evil designs of other people. A ring compounded of seven metals is worn to keep away spirits and ghosts. Stockbrokers, whose financial lives are often upon a knife’s edge balance, have a strong tendency to consult clairvoyants. Gamblers belief in lucky seats; actors in getting a long thread at his back and with some little objects associated with a successful performance in the past and seamen have their complicated system of rituals and taboos. The factory workers regard finding a new pair of shoes on the factory bench as threat of unemployment. All the competitive situations at workplace or at playgrounds and others tend to create amounts of anxiety and hence a solid foundation for the growth and a host of variety of superstitions took place. Jockeys have their lucky caps, cricketers their lucky bats and boots, footballers have their jersey numbers and touching goalposts at the commencement of a match. Motorists have lucky key-fobs, air pilots and astronauts take amulets with them on their flights (Irwin 2000, Jahoda 1969 and Malinowski 1948).

In our society, most of the families are experiencing the damage caused by different superstitious practices knowingly or unknowingly (Sarma J 2004, Deka 2006 and Bhattacharya 2006). Experience in our own family that was uprooted by devastating flood associated with erosion caused by the river Brahmaputra may be taken as a case. The hardship faced thereafter by the family in overall maintenance, during our primary school days, has always been regarded as a result of bad luck predetermined for our family. The
sufferings of our mother (Maa) from mild rheumatoid arthritis were transformed to a severe one for treatments by different quacks available in the locality. In the process her sufferings increased leaving no room for modern orthopedic treatment. Another instance, that is brutal killing of innocent people in the name of witches is now almost regularly becomes the headlines of newspapers.

Considering the enormity of the problem of superstition and its widespread manifestation among cross section of people in our society it is considered necessary to make an in-depth study to explore the influence of science and superstition in our society. To bring science to masses for eradicating superstition and obscurantism it will be necessary to identify the psychological and social causes which have pushed the common man to believe on such supernatural beliefs or God men. So, identifying the influence of superstition on different strata of the society is the need of the hour for initiating a critique suggesting curative and preventive measures so that scientific temper can make inroads among the masses. Superstition in different form and degrees is prevalent among different linguistic groups of people of Kamrup district of Assam and sample survey of these groups is expected to throw new light on this all-pervasive social problem.

The above accounts of the state of affairs prevailing in the some societies led the investigator to undertake the present study entitled ‘Influence of Science and Superstition among Assamese, Bengali, Boro and Garo people of Kamrup district of Assam’ with the following aims and objectives.

1.6 AIMS AND OBJECTIVES

The aims and objectives of the study were:

i) To discuss what people consider as science and superstition

ii) To analyse and find out the nature and degree of influence of various scientific phenomena and superstitious practices

iii) To explore the role of religious practices and traditional customs in the formation of scientific and superstitious bend of mind

iv) To find out the role of mass media with respect to scientific temper and promotion of superstition and
v) To propose different measures for expansion of scientific temper for eradication of superstition

With the above aims and objectives, the following hypotheses were formulated for the study:

(I) People understand science and superstition
(II) Science and superstition influence people
(III) Religious and traditional practices aid superstitions
(IV) Several superstitions contain traditional knowledge about health and medicine
(V) New types of superstitions are arising in society
(VI) Mass media also aid in the spread of superstition
(VII) Woman empowerment through science, aid eradication of superstition
(VIII) Advancement in education and cultivation of scientific temper will contribute to the eradication of superstition and
(IX) Science and superstition influence different linguistic groups of people differently

1.7 A BRIEF PROFILE OF THE SELECTED STUDY AREA

The study was carried out in the district of Kamrup (both rural and metropolitan) of Assam. It is one of the most important districts of the Brahmaputra valley of Assam in the North-Eastern region of India. The North-Eastern region of India is an extension of Sub-Himalayan zone consisting of lofty mountainous terrains, moderately high hills and, intercepted with plateaus and river valleys and are homes of Indo-Mongoloids or Kiratas and Aryans in the valleys of Assam. Aryans Hindu religious and cultural norms has dominant influence over Buddhism, Islam, Christianity and other religions in the region. Northeast region of India is often referred to as the Anthropologist’s paradise. Assam, almost centrally located in the region, has a synthesis of Aryan and indigenous cultural strains having Assamese Hindus as the dominant element with certain Austric and Dravidian ingredients. The tribal communities of the Karbis, the Bodo-Kacharis, the Zemi Nagas, the Kukis, the Dimasa-Kacharis, the Missings, the Tiwas, the Rabhas and the Deuris live in the hills and plains of the state with their different levels of acculturation and
integration. Saivism, Saktism and Neo-Vaishnavism have strong roots here—pervasive and abiding. Sizeable Muslim population also contributing to composite socio-cultural milieu along with significant Sikh and Christian community (Datta et al 1994).

A foreign country Bhutan bound the district Kamrup on the north, Indian state Meghalaya on the south, Morigaon and Darrang district of Assam on the east and Goalpara and Nalbari district of Assam on the west. It is spread between 25° 40' to 26° 45' north latitude and 91° to 92° 15' east longitude. The river Brahmaputra divides the district into north and south parts. Sonapur, Chandrapur, Guwahati, Palasbari, Mirza, Bijoy Nagar, Chhaygaon, Boko and Nagarbera are some of the important places in the southern part while North-Guwahati, Kamalpur, Rangia, Goeswar, Hajo and Sualkuchi are some of the important places in the northern part. Besides the mighty river Brahmaputra there are other smaller rivers, ravines, streams, hill-streams, wetlands, beels, flood plains, hills, hillocks are spread over the district more particularly in the southern part owing to the scenic natural beauty of the district. There are some river-islands or char areas in the river Brahmaputra. After craving out two of its sub-divisions, Barpeta and Nalbari as two separate districts in the year 1985, the area of present Kamrup district (both metropolitan & rural) is 4345 square kilometer having 177561 hectares of forestland. With two sub-divisions Guwahati and Rangia, there are 1342 inhabited villages with 490740 households, 9 towns, 17 development blocks, 14 revenue circles and 178 gaon-panchayts in the district. The most populous district of Assam comprises a population of 2522324 numbers with a density of 581 persons per square kilometer. The number of females per 1000 male is 901 and the literacy rate is 74.16%.

Kamrup is the most urbanized district of the state and cultivators and agricultural labourers together constitute only 33.63% of the total workers, rest pursue activities other than cultivation as their main occupation. Religion wise the followers of Hinduism dominated (72.80%) followed by Muslims (24.78%) and Christians (1.75%). Sikhs, Buddhists, Jains and people following other religions and stating no religion comprise only 0.67%. Linguistically, Assamese speaking dominated (72.78%) followed by Bengali (13.61%), Boro (3.89%), Garo (1.06%) and other linguistic groups together constitute only 9.03% (Statistical Handbook of Assam 2006).
1.8 Geographical Location of the Study Area