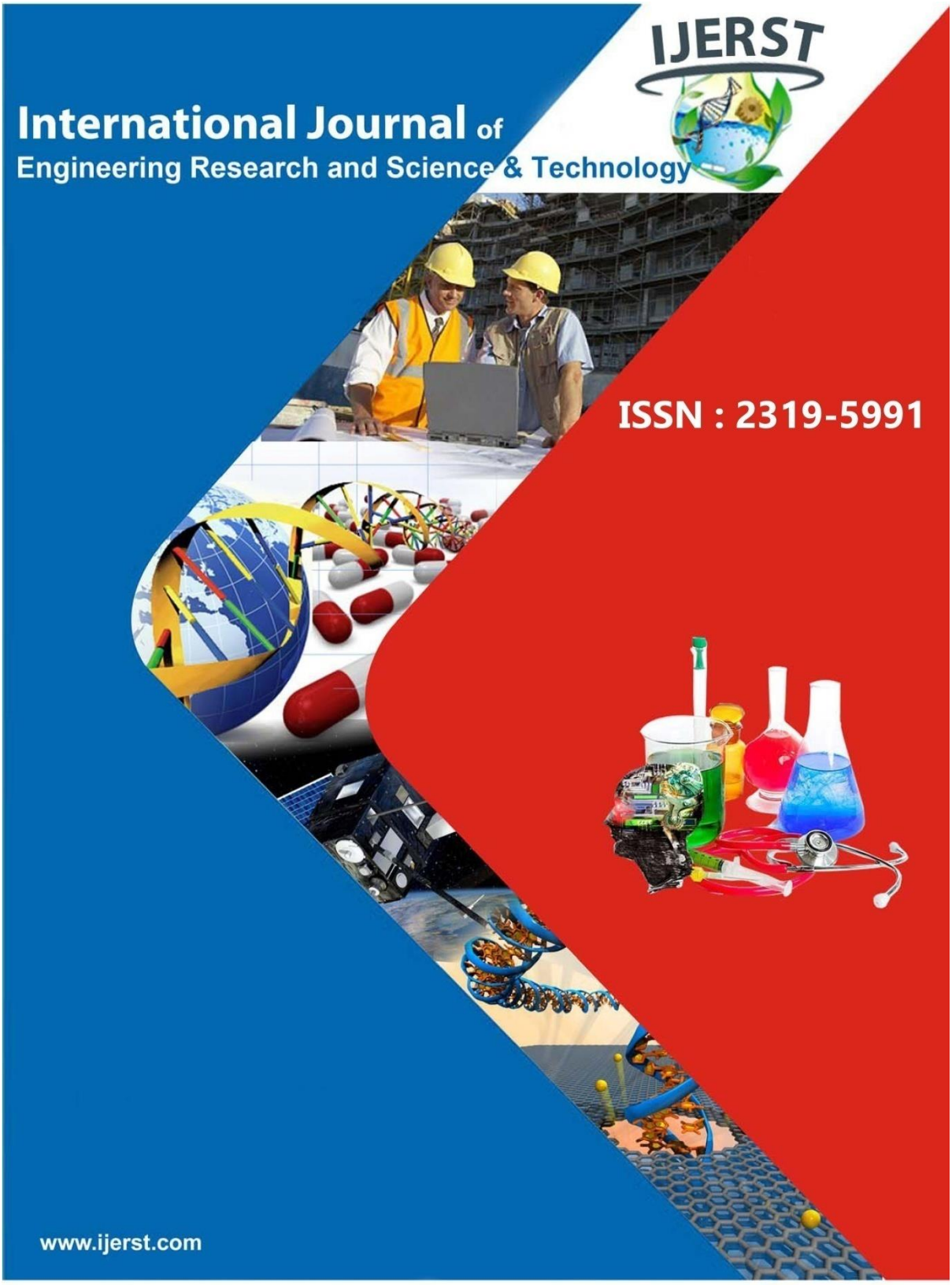

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Political Sociology of Science and Technology and Science Policies in India: An Historical Throwback

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In this paper the researcher tried to trace the political sociology of science and technology and science policies in India. It is being observed that today science and technology play a key role in all domains of life. Science and technology were recognized as important means to achieve economic development and cultural transformation. In India the science policy resolution of 1958 is indication of this recognition. However, access to basic science and technology and their application still confined to a meager section of populace. It is in this context that there is a need to promote science and scientific thinking among the people of the society so that population at large appreciates scientific knowledge and employs scientific approach to problems in sectors like agriculture, industry, and service and in day-to-day affairs. Indian history has enormous traces of scientific inventions and discoveries, it is also believed that India has shown the world the path of science and scientific thinking. Jawaharlal Nehru was one of the first influential leaders who spoke of the need for inculcating scientific temper.

Science and technology have transformed nature and social relations simultaneously over the last 250 years. Society provides human and physical resources for scientific and technical development which in turn have played an important role in the development of all modern societies. The material history of the human society can be considered a history of scientific and technological development. Now, more than ever, the engagement between science and everyday life has increased. Science and technology have become an inseparable part of our life. In this historical context, the interrelations between science and society demand an active academic and general debate.

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The connection among science and society is quite possibly of the most challenged subject in scholar and non-scholastic fields. It requests from the public a comprehension of and commitment with science and innovation. The public comprehension of science and innovation is significant for the improvement of individuals and country: It assists people in general with partaking during the time spent advancement through their dynamic commitment to the discussions on science and innovation and its application in their daily existence. It additionally helps them pick or reject logical and innovative products which could establish mischief to the climate and human body.

This study is an attempt to understand the relations between science policy resolutions of the Government and society through the framework of people's science movements. Science developments assume the part of a middle person among science and society. They endeavor to promote science among the overall population in various ways and suggests basic conversation starters about the uses of current science and innovation.

Science as an information framework has double perspectives. Right off the bat, as a strategy for gaining information, its systematization, translation and reaching of inferences, it assists with extending the skylines of's how man might interpret climate and empowers him to utilize it to shape his future.

Secondly, this knowledge, on the other hand also enables him to shape man's social, economic, political, and cultural life (Rahaman, 1970). So, science as a knowledge system is different from other systems of knowledge in terms of its objects of the study, methodology of the study and impositions that are made arising out of the method. Other systems of knowledge predate modern science. Historically, modern science emerged as a new system of knowledge.

India and its science modernity:

Present day science was embedded in India during the pilgrim time frame in light of the impact of current western development on a segment of the Indian culture (Jairath, 1984: 110). The diffusion of western science to non- European societies including India as drawn by George Basalla (1967) in his three- phase model. In the first phase, the colony (non-scientific society or nation) provides the source or raw material for European scientists to carry out scientific activities mainly in the fields of botany, zoology, geophysics, astronomy, and anthropology. The investigations are primarily for mastering the environment and canvassing its economic potentialities.

According to Basalla (1967), proper colonial science begins in the second phase when the range of scientific studies expands to suit the requirements of the colony and development of technological subject starts. This is because, at this stage, the scientific activity carried out in the new land is based primarily on the institutions and traditions of a nation, which possesses an established scientific culture. A provincial researcher (who could be a local or a relocated European homesteader or pilgrim) would have gotten some or all of his conventional science schooling in an European establishment, looks for the participation and respects of European logical social orders and distributes explores in European logical diaries. In this way, a provincial researcher relies on a logical culture, which is found. Basalla's third phase involves a conscious struggle by the colonial scientist to build up an independent scientific tradition, in which the scientist's major ties are within the country in which e works. These establishments of self-reliant scientific traditions are spurred either by political and national cultural nationalism, or by dynamic personalities.

Historians and sociologists of science in India criticized Basalla's model on various grounds. Jairath (1984) contends that

Basalla has emerged with this model in view of occasions that happened in Eastern Europe, north and South America, India, Australia, China, Japan, and Africa. In any case, he sees no difference amongst nations which experienced political and military colonization of various nations like America and Australia and the nations like India on the other; besides, Basalla altogether overlooks the varieties in friendly design and social customs of nations, when current western science was embedded there; lastly, Basalla's model doesn't manage the disappointments of the immature countries as opposed to the progress of the Non-European high level nations in making an autonomous logical culture. Thus, we find that Basalla does not distinguish between colonies. In the case of India, Britishers first entered as traders, then started ruling and later entered the cultural arena through gradual implantation of western science and technology. However, this is not the case with all the colonies. Moreover, within India, there were variations as some princely states of India were independent and not under British control. However, Basalla's model does not recognize such variations.

Sociological Implications of Science:

Robert k. Merton (1973) for the first time developed a sociological approach to the study of science by employing functionalist perspective. Merton argues that science is an institution, the particular goal of which is the extension of clear certified knowledge. The certification involves using the criteria of logic and evidence, which are pre-given and impersonal.

Modern science as an institution is normative in which the norms identified by Merton are:

- Universalism – science is open to sheer talent irrespective of the nationality, caste, class, and gender of the scientist.
- Communalism – sharing science and scientific knowledge through full and open communication.
- Disinterestedness – in here there is no vested interest on scientific knowledge
- Organized skepticism – in the following making of a final judgment through methods, not by dogmatism.

Merton's (1973) examination shoes a rising propensity for crafted by additional useful and prominent researchers to get increasingly more consideration. This cycle, which Merton called the Matthew impact, prompts the dissemination of acknowledgment, compensation for profoundly perceived researchers.

It is found that highly productive scientists at major universities like oxford, Cambridge, Harvard, Columbia, Berkely, and Princeton, gained more recognition than scientists at other universities (Crane, 1965).

Merton's theory says that inequality in science is the result of recognition and rewards based on productivity. But the unequal distribution of recognition is not merely due to individual talent but also due to the degree of access to produce knowledge (Mulkay 1979). In other words, the person, who has the greater degree of access to produce more, gets more recognition. So, we can say that all scientists may not get the same opportunities to create or produce scientific knowledge. Thus, the ethos of universalism, according to Merton, has serious limitation (Mulkay, 1979; 1980).

According to Ben- David (1971), sociologists of science have studied mainly the behavior of scientists, both as performers of a social role, which implies certain values and norms, and as members of a profession. For him, a role is a pattern of behavior, sentiments and motives recognized by people of forming a unit of social interaction.

Political Sociology of S&T and Science policies:

The increase in science and innovation in our individual and public activity and the rising worry of common society and backing bunches for science and innovation pulled in the consideration of science and innovation concentrates on grant on friendly/science development. The partnership between friendly investigations of science and innovation or Science Technology Studies (STS) and social/science developments (SMs) help to investigate the connection among science and society, the job of common society gathering or promotion bunch in the arrangement of science and innovation approaches, the obligation of the researchers and mainstream researchers towards the general public, the effect of development upon the direction and individuals' jobs in shaping and once again framing the science and innovation strategies.

The political sociology, humanism of science and innovation checks out at the political element of organization of science. As per Blume (1974) "the social foundation of current science is basically political and that, additionally, the logical job is an indispensable piece of the political arrangement of the cutting edge state" (Blume S Stuart, (1974). Science progressively relies upon the social, efficient and political design of the general public in which it is drilled. It looks at how new improvements in the field of economy, nation and society influence the act of logical and mechanical developments. It likewise puts the focus on the political commitment of researchers and the public commitment to science and innovation.

The science movement, according to McCormick (2006) questioned and reshaped the scientific knowledge that was organised in the expert and official circles. McCormick studied anti-dam movement in Brazil and also the environmental cancer movement in the United States (McCormick, 2006). She considered the process of scientization as the stimuli for the organisation of these two science movements. Jurgen Habermas (1970) conceptualised it in terms of the control of government and the decision-making by technical experts and bureaucracy officials, where common citizens have little influence. Through scientization or increasing strength of instrumental and vital rationality Habermas (1970) means "locate more and more decision-making power in the hands of the experts and administrative structures, which operate according to the system logic of money and power and whose decisions are correspondingly removed from contexts of justification and accountability within the life world." (Habermas J, 1970).

The course of action of scientization evolves a broad series of processes where scientific elements are fluidly interconnected with non-scientific spheres of life through which science will get unbounded power and authority. It will have a social and cultural impact; it leads to codification in technical things and the non-scientific elements like perceived culture, body and livelihood. And it leads to the scientization of the developmental policies and programs. The decision making in the policy level becomes increasingly dependent on the expert knowledge and technical consideration. This process marginalises those who are not part of formal educational system and of the decision making bodies. At the same time it gives more power to the expert and technicians. The process of scientization leads to the production of expert knowledge which is biased (Haraway, 1988; Harding, 1998) and corporate influence on scientific knowledge (Evans, 2010; Lave et al., 2010; Lawless and Williams, 2010).

The Public Understanding of Science and Technology

Alongside the improvement of science and innovation the interest for public comprehension of science and innovation and their support in it expanded immensely. Today, the connection between the logical mastery and overall population involves consideration and social concern.

The significant justification behind this backing is the way that the general population is a definitive buyer of the logical examination and a large portion of these investigates are supported by the public authority by utilizing the public assets. One more justification for this request is connected with the issue of endurance; it is difficult to make without appropriate comprehension of our environmental factors. Public comprehension of science implies dispersion of logical and innovative data and investigation of, as far as possible, advantages and chance of techno science. (Reference book of science, innovation and morals, volume-3).

The Council of Royal Society in its report under the leadership of Dr. W.F. Bodmer stated same opinion about the need for a public understanding of science. The report states that "people need some understanding of science, whether they are involved in decision-making at a national or local level, in managing industrial companies, in skilled or semi-skilled employment, in voting as private citizens or in making a wide range of personal decisions." (The Public understanding of science. (1985) Report of a Royal Society).

The document of Royal Society talks about the public understanding of science tries to define the concept in reference to three terms, namely 'the public', 'understanding' and 'science'. By science it refers to all branches of natural science including technology, engineering and medicine. The term understanding refers not only to knowledge about scientific facts but it includes the understanding of the nature of scientific activities and also the methods of enquiry. It should be dependent upon the need and purpose of the individual, like his occupation and his responsibility in the society.

The public is broadly defined as the non-scientific public. This 'non-scientific public' is defined at five levels and each of these groups has its own reason for the use and understanding of science. Firstly, the private individuals need scientific understanding for their personal satisfaction and well-being. The second group includes the individual citizens, and they need this understanding as members of a modern democratic society for participation in civic responsibilities. The third section of public are people engaged in skilled and semi-skilled jobs among whom the vast majority now have some scientific understanding. Fourth group of public is people employed in medium ranks of management and in professional unions and trade union associations. The final group includes people responsible for making major decisions in our society, particularly those in industry and government.

The Bodmer Report contends that an absence of public comprehension of science has three unwanted outcomes. An absence of prepared logical and mechanical faculty could slow the financial advancement; a general population with no logical information can't take informed majority rule choices about issues including science; and a deductively oblivious public is a socially denied public which passes up the delights and experiences that a more profound comprehension of science can bring. (Nicholas Russell, 2009).

As mentioned earlier, the discussion over the issue of public understanding of science and the relationship between techno scientific experts started from the early period of the industrial revolution and also the

development of science and technology. It got immediate attention after the 2nd World War as the public attitude to science became more ambivalent and the public lost its overweening optimism regarding science and technology. In the early periods scientists and experts tried to communicate and made open their research to the public through lectures. The works of J.B.S Haldane and J.D. Barnal emphasised the importance of public understanding of science. Other than these individual efforts, a lot of organisational and institutional efforts also took place.

The formation of Royal Society and other institution like British Association for the Advancement of Science, Social Responsibility of Scientist, etc. helped create a link between scientific experts and general public. They established science centers, science museums, science shops, etc. to spread science among the general public. They observed some particular day of the year as science day and week as science week.

During the 1980s a significant change occurred in the field of public understanding of science especially due to the emergence of different social movements, professional practices, and research. In 1982 Royal Society appointed a committee to study the science education in schools. This report under the chairmanship of Roger Blin Stoyle suggested 'that the Council of the Royal Society ought to set up a little working gathering to research manners by which public comprehension of science may be improved.' notwithstanding this various endeavors from legislative and non-legislative organizations occurred to upgrade public comprehension of science and to diminish the hole among science and society.

There are different perspectives about public understanding of science and technology that look at different aspects of public understanding of science, like the nature of the public, the techniques of communication, the methods and strategies of communication, nature of relationship between the communicator and communicated, etc. The deficit model of communication is very important and is the oldest one in the area of public understanding of science. This model is simple, one-way and hierarchical model of communication. This model considered the public as illiterate and as ignorant of scientific knowledge. They believe in the expertise and their role in communicating science to the general public. This model assumes that the greater public knowledge of science will lead to creation of positive attitude towards science among the public. A number of quantitative studies shows that the dominant practice of public understanding of science comes under this model (Yearley 1993; Wynne 1995). This model of scientific communication did not pay attention to the socio-cultural back ground of the public or their needs. It ignored the potential of the local or lay people and their knowledge developed through experience from day today life.

David Layton and others (1993) argue that the lack of public understating of science is often conceptualized in terms of a paternalist ‘deficit model’ in which passive lay consumer of knowledge have cognitive gap (i.e. ignorance) that need to be filed by the producers of expert objective knowledge. They proposed a brand new model of public communication of science, which is ‘interactive model’ which primarily focuses on the process of making the public a participant in science, technology production, decision making and policy formation. Its focus has took a shift from the cognitive to the contextual understanding of science. (Irwin, Alan and Mike Michael, 2003) It rejects the objectivity of expert knowledge, passivity of non-expert consumer and the homogeneity of the public. It looks at science as a socially constructed and

influenced endeavor and that is dependent up on context and societal demand. It proposes a dialogical model of scientific communication. It gives space to the people and engages with 'lay epistemology'. It means those lay people can possess knowledge and reflect up on the knowledge through their day today experience. (Irwin and Michael; 2003)

The ethnographic study of Wynne (1996) and Epstein (1996) shows that the deficit model is not enough to understand the phenomenon of public understanding of science. Wynne'(1996) classic study of the Cumbrian sheep farmers shows that the potential of the local knowledge to challenge the expert pronouncement of environmental science. He proposed a new way to problematize the relationship between expert and public. Rather than feeling that the problem is the public ignorance of the science, according to him, the problems lies in the ignorance of the expert on the issue of public understanding.

Epstein's (1996)studies of the health activism among the AIDS victims in the USA explore how a distributed community come together to participate in the production of clinical and medical knowledge and come forward to educate themselves about the relevance of science. Hess' (2006) studies about social movement and the counter expertise also reject the deficit model of public understanding of science. A number of ethnographic studies highlighted the role played by non-experts in the production of scientific knowledge.

Some observations on Literature:

The science movements in regions and in different fields highlight the role played by public in the production of scientific knowledge; sometimes they also question the mainstream expert knowledge. These movements, which are already discussed, challenge the expert knowledge and at the same time they play an important role in the enhancement of the public understanding of science and technology. The first step in each movement is to create awareness among the people who are engaged with the movement. It helps to enhance their knowledge about the problems and possibilities of science. So, the science movements are the important ground where the public understanding of science can be improved and debated.

The social movement and public understanding of science and technology are interrelated concepts and practices. The public understanding of science and technology helps the public to understand the potential benefits and risks in application of science and technology. This reflexive understanding of science will lead them to engage with science and technology related public discourses. The shift from public understanding of science (PUS) to the prominent public engagement with science (PES) marks an important change. The public understanding and engagement with science mainly focus on public appreciations of science and technology. Science movements on the other hand launch direct action for/ against science and technology related issues. The science movement, with the support of critical reflexivity of actors and participants pose relevant questions on policy making and application of scientific knowledge and technological artifacts.

The present study is an endeavor to understand the role of People science movements in the process of diffusion of scientific knowledge and their perception of how and to what extent the individuals and groups in the society receive science.

Sociological Literature on Science Movements and Science policies: Historical Views

One significant and striking characteristic of the colonial activity was that it was completely controlled and guided by the

government during the rule of the east India Company and later by the British government. According to Kumar (1983), excessive importance was given to the scientific staff of European origin, both in the recruitment and promotion to higher positions. Due to discriminatory practices, followed by the British scientists, the Indian scientists, with the meagre support of a small group of missionaries and British scientists, started to popularize science in India with a nationalist direction (Krishna, 1991). The eminent Indian scientists who laid the foundation for the science development of science in India with a nationalist tradition were such as Ashutosh Mukherjee, Mahendra lal Sircar, Meghnad Saha, Prafulla Chandra Ray, CV. Raman, Jagdish Chandra Bose, Ruchi Ram Sahni and others.

Prafulla Chandra ray laid the foundation of social history of science in non- European countries especially in India, which unfolds the facets of 19^{th} century perception and the ideological significance of science in India. He founded The Indian School of chemistry during the 1920's and contributed in a large way to the development of pharmaceutical industries with the overarching aim of economic and scientific self-reliance. Ray's magnum opus 'The History of Hindu Chemistry' (1902; 1907) shows his application of scientific knowledge to the extraction of the secrets of the nature. In addition, science came to the days of M, L, Sircar, required establishing a strong system of scientific research in India under our control and our management (Sarkar 1946; Raina and Habib 1995).

M. L. Sircar (1833-1904) advocated science and scientific spirit to fight superstition and dogmatism ant to work towards national regeneration. He pointed out that the colonial government had not provided any opportunity or any encouragement to Indians for the pursuit of science (Krishna, 1991). So, Mahendra lal founded the Indian Association for Cultivation of Science (IACS) in 1876 in Calcutta with the aim of popularizing science for nation building. At the beginning the important activity of association was to organize popular talks by well-known scholars and scientists. Sircar was motivated by the patriotic need to have an institution where Indian scholars could be trained in science by India teachers (Krishna, 1991), to be able to carry out original research in physical and biological science was the torch bearer of a national effort for the promotion of different branches of science such as common physics, chemistry, astronomy, botany, zoology, physiology, and geology etc. in India based on self- reliance. This shows the institutional form of science development (Sangwan, 2000).

In the field of physics C.V. Raman, J.C. Bose, S.N. Bose, and M.N. Saha formed the Indian School of physics. By using the institutional form of science development, C.V. Raman (1888-1970) built a major theoretical and research school in physical sciences in Calcutta and continued to do outstanding scientific works. Later, in Bangalore, he became the first person in Indian Institute of Science (IIS) in 1933 where he started the new physics department and continued till 1948. In 1949, he established the Raman Research Institute (RRI).

At this juncture, M.N. Saha (1892-1956) made his contributions to several topics of Astrophysics. Astrophysics is a branch of astronomy (the science that treats the location, magnitude, motion and constitution of celestial bodies and structures) that treats the physical properties of celestial bodies such as size, mass, density, temperature, and chemical position. He is famous for his solution of stellar spectra called in astrophysics as 'Saha Ionization Equation'. As result, he established an institute called as Saha Institute of nuclear physics at Calcutta for

advanced studies and promoting interest in nuclear physics. He also worked on calendar reforms and extensive applications of science to society

In the field of plant physiology, J.Chandra Bose founded a research institute called as Bose Research Institute in the year 1917 at Calcutta for carrying for carrying out research on various aspects of plant physiology. In 1917, Bose Research Institute started its own institutional journal called the 'Transactions of the Bose Research Institute'. Thus, Krishna (1991) states that institutes established by Indian scientists were necessary for popularizing science in colonial India to revive the rational and experimental tradition.

The science policies in its core form had begun with the publication of a scientific journals like Asiatic Research, quarterly from the Asiatic society, Calcutta in the year 1788. Sir William Jones established The Asiatic Society of Bengal (ASB) in Calcutta in 1784. Following this, there has been a significant development in the formation of science institutions and publications of scientific literature for science development among the people of colonial India. As a result, the literacy society of Bombay (BLS) started by Sir James Mackintosh in 1805. The aim of the society was to establish library, museum, and an astronomical observatory, which would stimulate interest in science. The Madras Journal of Literature and Science (1835) published surveys of villages and cities. The Bethune Society (1851) of Madras also had regular discussions on various aspects of social sciences such as education, health, and society. Thus, scientific societies established by individuals play an institutional role in science development by public demonstration of new discoveries, popular lectures and publications of scientific texts and scientific journals (Sangwan, 2000).

Specialized scientific societies like the agriculture and Horticulture Society (1817), Medical and Physical Society (1823), The Phrenology Society (1825), Society of Arts and Science (1855), were established for the diffusion of scientific knowledge. All these voluntary organizations arranged discussions on agricultural implementation, tropical diseases ad their local therapies, art, and scientific practices etc. on the other hand, The Dawn society (1902) worked in technical education.

The Indian Science Congress started by Asutosh Mukherjee in 1914 represents state of science in India and marks as the national commitment to the cause and spread of science. It provides an ideal setting for individual scientists to exchange ideas on food, nutrition, health, education, infrastructure, and environmental security as well as a collective evaluation of the progress made.

Scientific movements through mother tongue were given its due place by Ruchi Ram Sahni (1885) and S.N. Bose (1948). He popularized science among the state of Punjab, which had been seized by superstitious beliefs. In this connection, he gave lectures (in English and vernacular) on the practical applications of science and demystifying the secrets of experimental science for ending the reign of darkness. Ruchi Ram adopted Punjabi, the language of rural folks, to convey the meanings of scientific knowledge to the rural amenders as well as town-based traders. He found that mother tongue was the best medium to communicate modern science in people's language also enables the people to adapt scientific knowledge and technologies to their environment and finally contributes to the development of alternate technologies.

The publication of ancient scientific literature in the field and textbooks took place at massive scale in the early 19th

century. The early days of science development in Indian languages could be traced back to the papers published in the monthly Digdarshan from Srirampur (Hoogly), West Bengal in April 1888 in Hindi, Bengali and English. The role of vernacular or regional scientific periodicals, newspaper-cum-magazines and science-based articles by individual scientists in science development were more effective in pre-independent India (sehgal, sangwan and mahanti, 2000). For example, Bengali Science Periodicals called Bignan Sar Samgraha, Vigyan Darpan (1876), Sachitra Vigyan Darpan (1882) had envisaged a common objective of Indianizing western Science. (Sangwan, 2000).

Along with Bengali textbooks and periodicals on science, the above were popular science entries, which paved the way for the vernacularizing and indigenization of western science and scientific world-view. Chacraverti (2000) opines that development could only success through a comprehensible medium and states that Ramendrasundar Trivedi, a science popularizer of Bengal in colonial India was strongly in demand of vernacular.

Accordingly, science in pioneer India laid on science congresses, logical and modern presentations, workshops, modern and mechanical historical centers, public talks, famous science magazines, and so forth were not many among the fresher improvements toward science correspondence. However, Patairiya (2002) contends that the spot of these exercises stayed low, and no critical exertion was made to promote science among individuals and instill logical attitude among them. A similar example went on till the freedom.

Present Perspectives:

When India became independent in 1947, government realized that science and technology is indispensable for economic and cultural development. As a result, science development was being taken up at various levels. Individual scientists like Meghnad Saha, Homi Bhabha, Bhatnagar, Kothari and others had called for to transform Indian society particularly to accelerate national development through dissemination of scientific knowledge. Menon (1997) argues that he supports towards scientific temper and to create infrastructure for the dissemination of scientific knowledge in post independent India came from Jawaharlal Nehru. With the efforts of Nehru, science policy resolution of 1958 noticed the importance of promoting individual initiative for the acquisition and demonstration of knowledge, and for the discovery of new knowledge, with an atmosphere of academic freedom. The significant steps during independence to popularize science in India were to set up autonomous research bodies by the various scientific departments of the government of India, the DAE, DST, DSIR, DOS, DRDO, DOE, DBT, etc. The CSIR society also worked in the direction of promoting self-reliance by creating advance laboratories in various fields all over the country.

Government's realization for the need of scientific awareness had started in the late 1950's where a few Vigyan Kendras by the Department of Education especially in rural areas; it used to be more a museum than an activity Centre managed by young science post-graduates. Cultivate an interest and consciousness of modern science among masses; the aim of scientific policies includes

- Publishing science books and periodic journals to improve scientific thinking
- Organize meetings, discussions, science film shows, and
- Assist other government agencies working towards similar goals.

Government of India's' The Department of Science and Technology (DST), established Vgyan Prasar as an autonomous registered body in 1989, for taking up large- scale science development and to establish a network of science clubs in the schools of different parts of the country. Thus, development of science may be done through a combination of the following.

1. Scientific bodies like ICAR, ICMR, CSIR and non- governmental agencies etc. as product of scientific knowledge influence society through policy framework and application of science and technology.
2. Policies like the Scientific Policy Resolution of 1958 and technology Policy Statement of 1983 provides the physical and financial resources and legitimacy.
3. Individual scientists like C.V. Raman, Jagdish Chandra Bose, Haldane, Sahni etc. as interlocutor between science on the one hand and society on the other.

Perspective of the Present Study:

Sociological perspective understands social phenomenon in terms of social groups and institutions. Science, being a new institution and a culture. Science as a legitimate social activity must be established in transforming economy and culture of society. Science operates in each social and cultural context where the new knowledge produced by science s applied to new problems. These social cultural contexts include the attitudes, values, and beliefs of the people in relation to science. Science permutes productive sector such as agriculture and industry for enhancing productivity through a better understanding of nature and properties of materials. This helps in evolving strategies of intervention. In the societies like India, where modern science was implanted from the Western Europe, the new knowledge for its acceptance and application must be made either compatible with the existing knowledge, values, attitudes, or it must be seen as a neutral knowledge. There is a possibility that it is faced with resistance. In this context scientists play an important role.

Scientific development focuses on the role of scientific temper and its world view. Here the pioneering works and contributions can be evaluated in the context of sociology of science as studied by the sociologist Joseph Ben-David. Ben David (1971) points out how in history science movements played a role in transmitting the knowledge about the world generated by science by employing a set of methods. He further argues that in the 19th century it was the German-speaking world, which evolved the optimal social role for the science. Ben-David also argues that scientist movement in Western Europe played an important role in making the new system of knowledge about nature vis-a –vis theological acceptable through demonstrations and tests.

The study provides insights from integrative perspective on sociology of science. If we want to have real picture of how the philosophical, political, social, and literary currents of a time interact with science, on can preferably focus on the organizations. Most of the research into this genre have been historical which is currently labeled as the historical sociology of scientific knowledge (SSK). The present study throw light on the approach to the historical sociology of scientific knowledge. The study focuses on the organization role on science-society interface. According to Marxist thought, science and society must interact synergistically for mutual benefit.

Diana crane (1989), in her book 'Invisible Colleges' observes that the science organizations in scientific communities play a great role in bringing new knowledge. According to her, scientific growth is a cognitive one and is a kind of diffusion process in which ideas are

transmitted from person to person. Within the scientific community, the present also draws upon diffusionist model to understand the context in which science gets diffuse to society at large. According to Sangwan (2000), the diffusionist model analyses the acceptance of new knowledge by colonial scientists and their collaborations such as commentators, communicators, popularizers, users, and audience.

Science as a belief system about nature, which could be seen to change belief systems. This change is part of social and cultural change. The study examines the science movements' role in bringing out social change by disseminating scientific worldview based on rationality and empiricism with the goal/idea of changing the system of attitude, values, and beliefs of people. Marxist and Weberian theory of social change guide the present study. The former sees science as a liberating force at two levels and these are:

1. At a conscious level of the individual.
2. At the material level of the individual.

Conscious level talks about changes in the cultural and material level brings change in the level of production. For example, in the field of agriculture and industry. On the other hand, Weber sees science in terms of rationality. He further argues that science as process of rationalization.

As mentioned above, the study relates to science and society interface. While society provides human, physical, and cultural resources for the growth and development of science, the scientific knowledge that is generated will in turn influences society and brings about social change.

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