

THE JESUITS IN INDIA AND THEIR CONTRIBUTION
TOWARDS A KNOWLEDGE OF SCIENCE IN INDIA:
PROBLEMS AND POSSIBILITIES (1542-1723)

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MASTER OF PHILOSOPHY

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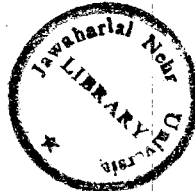
CERTIFICATE

This is to certify that the Dissertation entitled **The Jesuits in India and their contribution towards a knowledge of science in India: problems and possibilities (1542-1723)** submitted by **K.V. Shaji**, in part-fulfilment of the requirements for the Degree of **Master of Philosophy** has not been previously submitted for any other degree of this or any other University. To the best of our knowledge this is an original work.

We recommend that this dissertation should be placed before the examiners for their consideration for the award of the above mentioned degree.


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For

Acchan Amma and Juty

Acknowledgements

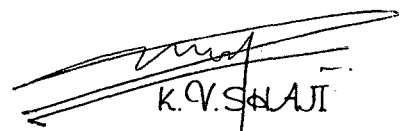
It has been a very interesting journey for two years now. There have been so many happenings, but yet some people have always been there, but for them, my work would have stopped a long time back. The help that I have received can in no measure be expressed in words. However at this point I would like to express my thanks and gratitude to my Supervisor Dr. K.K. Trivedi without whose help and 'gentle persuasion' this would have stopped half way. He has been extremely patient with me and through the many discussions I have had with him I have learnt a lot.

My parents for putting up with this eccentric son, and for all the support and patience they have had with me. The many visits home, have given me a lot of food for thought (quite literally too!). I need to at this point tell them that I still remain as confused as ever.

And then, my friends, what of them? Well most have as all the others, put up with me and for that they need to be thanked. Names? Chinnaiah, Pratik, Lima, Parvinder, Senthil, Gopi (especially for the tiresome translation work). These are but a few. So many of us have seen darkness, dengue and the problems with moving in to a new place. I need to acknowledge them too.

And Anil of M/s A P Computers for sitting through this night.

For the moment this is it. I shall write again.


K.V. SHAJI

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Introduction

Science studies have long been clumped together with a study of its component changes, the result, is as we see a study of bits, usually the arrival of a technology and its consequent changes. Very few studies have attempted it the other way round. The characterization of science is as an idea, as a product of society itself, as a cause of change, rather than something that is changed. This is also because of the very crisp definition of science that is seen and felt today. An assumption that it had always been that way is the first to be made. This has many consequences; one of which is the study of 'events' as we see it. For example the arrival of the wheel and consequent change, the compass and it help to navigation etc. The result is what can be in short called 'technology studies'. The fact that some amount of 'thought' went into the production of technology is acknowledged but not studied. That this thought has not been crisp and linear but has been a series of hits, misses and compromises is a fact that is seldom if ever studied, especially within the ambit of science studies.

Science studies have also started looking at it from the arrival of at the arrival of 'western' science, something that is understandable because of the ease of definition, considering that most science is assumed to be 'given' or 'transferred. Hence, models of such sciences occur within

studies of colonial policy, and also explains for categorization as Macleod's low 'science' and 'High science'. Another study is the work of Basalla, who gives the stages of science, the first stage being that of a non-scientific society providing for an European science.¹ This categorization is not readily acceptable. Other studies go to prove it was not so. Traditions in India were different admittedly but were not non-scientific as is demonstrated in Rahman's Bibliography.²

Another thing that is to be noted is the fact that the attempts at classifying not make much of the fact that notions of science were only to emerge and the early period is one of amateurish adventures, the more successful of which went onto compose a later 'science'. The haphazardness of enterprise, the energy of the contributors and the vast nature of such indulgences is noticed in the kind of documentation that is supposed to exist and have the many ways into which an early 'science' diverged. Newton himself is the classic example, before he went to make a mark in the intellectual clime of his day he dabbled in many other things.

This is what separates a later science from it's haphazard birth of birth, and as Deepak Kumar says this is what distinguished colonial science. Among the many essays in Deepak Kumar's book is one by

¹ George Basalla., *The evolution of technology.*, Cambridge University Press., 1986.

² A. Rahman (ed.), *Science and Technology in Medieval India: A Bibliography of Source Materials in Sanskrit, Arabic and Persian*, (INSA: New Delhi, 1982).

Satpal Sangwan which tries, briefly though, to locate 'Why did the Scientific revolution not take place in India'.³ He goes on to list out a set of factors which I think are extremely important in the understanding of the period. He attempts to understand the configuration of Indian science by understanding its relations with patronage, education, the role of the Individual, and of religion and in the case of technology, its relations with land, authority and caste.

The work of Irfan Habib calls for understanding the wider social configurations of a science in mediaeval India, especially since it comes back to the Needhamian question of asking why the conditions. For a science failed to arise in India.⁴

Studies of an Indian response to technology exist, as in the work of A.J. Qaiser.⁵ The work of Qaiser is extremely detailed and provides an excellent view of the influence of technology on society and the sources and the sources are just as vast. The only constraints to such a study being the collection of relevant data and the data relating to science and technology are widely scattered. Since most medieval accounts tend to gloss over the technical and scientific aspects of things it becomes the task

³ Satpal Sangwan, 'Why did the Scientific Revolution not take Place in India' in Deepak Kumar (ed.) *Science and Empire*, (Anamika Publications: New Delhi, 1991).

⁴ Irfan Habib, 'Reason and Science in Medieval India' in D.N. Jha (ed.) *Society and Ideology in India: Essays in Honour of R.S. Sharma*, Delhi, 1996.

⁵ A. J. Qaiser, *Indian Response to European Technology and Culture (AD. 1498-1707)*, Oxford University Press, 1982.

of the writer to piece together scattered observations in texts, paintings and material evidence.

Other studies are within the topical fields of agriculture, and general surveys of science in India, usually starting with a frame of reference that coincides with conventional periodisations of history into the ancient, medieval and the modern, and usually involves researching the origins of a particular technological achievement.

Among the most monumental of such studies of science is J.D. Bernal's *Science in History*.⁶ To quote him on the nature of book "If it has any bias, it is on the side of the influence of science on history rather than that of history on science".

However what is glossed over in all this is transformation that the body of knowledge itself undergoes. This can be attempted by a study of the influences of contemporary society on the knowledge systems.

Another related debate is the Weber Thesis which looks at the rise of Protestantism to the rise of rational risk taking in certain parts of Europe; which was further extended by the Merton thesis to trace the origins of a capitalist mode in these areas.

⁶ J. D. Bernal, *Science in History*, 4 vols, Pelican 1965, p.55.

On the other hand Francois Russo⁷ says, that nothing can be concluded from the fact that both the reformation and science were contestatory of Catholic world views. It also need to be noted that the reformers themselves were careful not to move away from the scriptures.

The backward tracing of this thought (science) from its product (technology), has brought many interesting questions. Among the many is the question of a non-rise of science in the east. This question implicitly assumes that science as we know it is fully western in its content and form. This meant that other 'sciences' like the Indian , the Chinese etc. need to be studied as the variation of science proper or as evolutionary dead ends of possible sciences. This also means excising of a role for indigenous thought and culture in this 'Science' today. A preceding assumption that is however never stated is that this science was 'transplanted'.

The other argument that tries to get over the implications of the assumptions of transfer and evolutionary dead ends uses an assumption from the opposite end of this argument, starting off with the assumption that science did exist, in cultures other than Europe, but that, the science that finally arose in these cultures had little or no relations to its past, prompting the study of these 'failed sciences' as curia and to account for

⁷ Francois Russo, 'Catholicism Protestantism and the development of Science in the Sixteenth and the Seventeenth Centuries'.

its failure. The Needham question thus remains unanswerable, a historical impossibility. As a consequence science has been studied as a series of 'whodunnit first?' questions.

This has given science studies two simple projects, (i) to map variation among the 'many sciences', the Western, the Indian, the Chinese, and giving each its due, or (ii) the glorification of antiquity and of ascribing this failed science immense possibilities making it possible to then account for its failure; which usually happens to be the intention. This mapping of variation has led to attributing of particular achievements to every culture.

The possibility for social studies of science is thus immense. That science idea is to be understood. How then was this idea different? Does this idea 'belong' to anyone at all? What then are the changes that make it such an explosion in the seventeenth and the eighteenth centuries without getting into the trap of looking for similarities or the lack of them when the idea is taken up with respect to India? Was the nature of this idea as crisp as we see it today? These are very large and complex questions, and these have to be looked at from within the social studies of science. The period chosen is thus for very obvious reasons the period of this rise of science the sixteenth and the seventeenth centuries.

These are the questions that need to be answered. The basic assumption that guides most studies of science in the period is that

science arose in the west and was then transferred. This is the assumption that we shall investigate in the coming chapters. However there is another thing that we need to understand before we move on. The nature of the science in the period with relation to the people we think of as carriers of this knowledge. The group taken as the location of this rise of science are the Jesuits. This is preceded by a short chapter on the background of the Jesuits whom we know as a religious body. This is a role that is understood and this is something that I have left out in the chapters. However I have attempted to give a brief of their activity and background in Chapter I.

Chapter II tries to give science an identity, through its struggles to separate from religion and the challenges the Jesuits face.

Chapter III are the problems with this science in India, due the peculiar conditions in which the holder of this knowledge / idea finds himself

Chapter IV looks at the possibilities for this idea to take root and be 'transferred' as openings for it exist, and to understand the character of the changes that happened in 1723 in the court of Sawai Jai Singh, and what made it different from earlier possibilities.

Thus what I have attempted can be only termed as an understanding of this area.

The sources have been the most troublesome in this effort and specialist libraries that stock on the studies of the confluence of science and society, are very few. Source for these chapters thus have been varied. Chapter II has had, me look at the writings of a series of 'mind changers' the philosophers of the period, which I thought was a convenient and manageable way of getting to know the 'mind of Europe'. I have therefore stressed the understanding these philosophers had of their position in time and their varying responses as indicator of change of the identity of science Chapter III and IV have made me look at the many sources of the Jesuits, the mere size and volume is amazing as also encouraging. This I realized was a bigger problem than the scarcity of sources. The Jesuit letters are the largest and most interesting of the documents of the group. They are available in a wide variety of languages, Tamil, French, Portuguese and Latin. The letters were divided into private and public letters. The private letters were known as the *Hijuelas*. The letters of Xavier and others are important for this initial period of contact. The attitudes are most lucidly expressed in his letters to the king, and instructions to the members of the society.

Contemporary accounts like company records help in locating the position of the Jesuits in India and also give the best and broadest possible idea of conditions in India. The records of fort St. George, the *Ain-I-Akbari*, and records of travelers and administrators also helped in ascertaining the tone of the period.

A late series of Jesuit texts, the *Lettres Edifiantes*, is probably more well known and is markedly different in content. References to the contests of knowledge of the period was what was looked for in these. The letters contain voluminous material on the process of conversion and the administrative matters of the society. This was due to the policy advocated by its founder, to send in letters about everything to keep the society close knit. The letters were also published which meant that for the Jesuits these letters were very important and hence a progress of work done was given in many of these letters making for interesting observations. The letters have a major disadvantage of being scattered, in private collections and in the Goa archives. An exclusive dependence on the letters alone was avoided. Translations have also started slowly becoming available.

Chapter I

The Jesuits: A Short Background

The catholic church has an order, a group called the Jesuits. The society of Jesus as they are known, was founded by the Papal bull *Regimini militantis ecclesiae*.¹ The founder was Ignatius, born in 1491 in the Basque province of Spain. Ignatius was a courtier at the court of a noble man. Ignatius was a military man and his training was such. He was injured in the defence of Pamplona, in 1521. During his recovery period, he read religious literature, and felt a desire to make a trip to Jerusalem. He renounced his dress and manners of a courtier and lived on alms on the way. During this period he composed the *Spiritual Exercises* which was published later after many changes in 1548. Bad weather made him abandon his plans. He returned to Spain, and started on a program of educating himself and visited Barcelona, Alcala and Salamanca. By 1526 he was in Alcala, where he entered into debates without purpose, leaving him confused. Yet the effect of his lifestyle was to influence a group of friends who started following Ignatian example. This was perhaps the beginning of this order. In 1527 he moved towards Salamanca, another

¹ William. S. Bangert , *A History of the Society of Jesus*, The Institute of Jesuit Sources, St.. Louis 1972. P.22.

university town. Here he was harassed by the Dominicans - another order of the Church.

Ignatius thereafter set out to Paris and arrived there in 1528, in order to pursue his education. In the meanwhile, his first band of associates had dropped out. This was replaced by new associates at the Paris University. This group included, Francis Xavier who was to later come to India. They put themselves at the service of the people and began functioning, as they would function throughout, as a bridge between state, religion and idea. They were put in roles of diplomats, professors and managers of missions, and schools. They were the spokesmen and arbiters for the Catholic Church, participating and often winning debates against the Protestants. The intent of the order was thus, even from the beginning, that of a defense against attacks by the newly emerging attitudes towards the Church. They were as such at the forefront of the Counter Reformation. The Jesuits were however set apart from other religious orders in one important aspect that was their education which was of a very high order. The role of the intellectual was what they had donned. The council of Trent had in the meanwhile been formed to look into reforms in the Church, especially in the wake of the Protestant challenge. The council of Trent commended the Jesuits for their work and reinforcement of the traditions. The order had a superior general at the head, who was elected for life.

What in 1540 had been a group of ten had in 1556, grown into a society of a thousand. The base of the Jesuit was his relationship with education. As mentioned earlier, the character of the initial group had been of students. Moreover Ignatius's experiences with debate in Alcala, into which he had jumped after a brief period of education, had changed his idea about education. His experience of immature participation in debate, on a variety of fronts had taught him how confusing such an attempt could be. He thus developed an idea of what education should be like, advocating a hierarchical and ordered scheme of education.

As a means of educating the members of the order, residences were made in university towns. This was the first step; the above roles of the Jesuit demanded a high equipage in education. In 1546, the first externs were beginning to be taught. This was the beginning.

Jesuits' active role in the spread of education, irrespective of its content, made them popular. Their services were utilized soon by the personnel of the Portuguese trading companies who preferred to send them to the new locales of their trading centres to impart education to the children of the company servants and the local populace. This was sought to be achieved through the establishment of schools and colleges. Talking of the establishment of the college:

The lord governor [of Goa] has told me that I should write to you at great length about this college and its foundation. It was founded so that the natives of these lands and those coming from

different tribes and nations might be instructed in the faith; and so that they after they have been well instructed in the faith, might be sent to their native lands in order to gain fruit with what they had learned.²

The Jesuit educational institution was first established in a city in Europe. The first school for externs was set up in Gandia in Spain in 1545. Another one was set up in Rome. This was the ideal institution and other schools modeled on this were established in all places of Jesuit activity. By 1556 the number of such schools had reached thirty-six. These institutions were administered on the basis of temporary working papers until in 1599 the *Ratio Studiorum* was published. The fact that this institution was experimental and was hindered by a lack of communications between India and Europe makes the arrival of the college in 1542 an achievement

The missions were the other passion of the Jesuits, and as mentioned earlier they were attached to the trading empire of the Portuguese. They went both east and west, the east saw them go to India, China and Japan and the west saw them in Brazil. In 1549, Manuel da Nobrega was the head of this mission. The other missions were in Africa; Morocco, Congo, and Ethiopia in 1548.

² M. Joseph Costelloe, tr., *Letters and Instructions of Francis Xavier*. Letter from Francis Xavier to Ignatius of Loyola in Rome, Goa sept 20 1542, Gujrat Sahitya Prakash. 1993.

Jesuit work went well until 1580 when Spain took over Portugal. Jesuit relations with Spain were uneasy and cautious. The change in political situation caused a 'decline' for the Jesuits. Their uncertain status and the moves they made in the east are reflective of this tension. The decline of the Portuguese meant the formulation of new equations for the Jesuits. There was a need to expand the base of their patrons. The accommodation of other nationalities was initially a halfhearted affair. Many of their letters show the tension between the Jesuits of other nationalities.

The French missionaries were a response to this change. The Jesuits now searched for newer avenues of patronage especially with the local authorities other than Europeans. This development had consequences for our study. There was thus a gap between the preacher and his early patrons. As a result of these forces, there was a change in the areas of Jesuit operation and they spread out into lands that were earlier outside the influence of the Portuguese. As a result the demand for workers went up, prompting the demand for a 'native' clergy. The French missionaries, the *La Compagnie* was the result of such a perceived need, as an order to specifically train the native priests. This new nationality of the Jesuit outside the authority of the Portuguese caused them some problems. The result was the decision of the Clement X in 1673 to ask the *La Compagnie* to submit to the Society in India.

The fate of the Jesuit was increasingly linked to nationality. This was the result of the rise of Monarchies and the decline of the excessive dependence placed on the Church for sanctification of action. The rise of strong national identities thus had advantages as well as disadvantages for the Jesuit. The result was the expansion of the base of the Jesuit both in Europe and in these new areas. However there was one disadvantage to this story. The Jesuit had to now make up for a lack of revenues in that they had to find patrons other than the state. This was the opposite of what they were doing in India.

The Portuguese had arrived in India in 1498. Goa was captured from Bijapur in 1510. The *Estado da India* was established. There were forced conversions as the Portuguese launched an intensive Lusitanisation drive to increase their stability; to cause for a shift in the population and help them entrench themselves on these new areas. The forced conversions and bad terms with the neighbors had locked in the Jesuit too; they could not move out of the Portuguese enclaves into the surrounding country.

Francis Xavier arrived in India in 1542, and entered Goa along with the new governor Martin Affonso de Sousa. Xavier stayed in Goa for four months, during which he was engaged in working for the people in Goa and among the sick. He also preached to *Soladados* the and *Casdados*, the soldiers and the mixed blood populations whose morality he

complained about in his letters and whose activities he said reduced the chances of converting the locals. The Portuguese had started mixing with the local population and many of them had local wives. Thus a new community had arisen. Apart from conversions, the Jesuits worked for the formation of a college in Goa, known as St. Paul's. The Jesuits thus came to be known as the Paulistas, after the name of this college. The Jesuits's headquarters were in Goa and Punicul on the Fishery coast. There were many problems these missionaries faced as the letters would indicate.

Being backed by the Portuguese naval establishment, there were a lot of conversions especially on the Fishery coast, among the fishers the *paravas*, nearly 20,000 by 1552.³ Xavier went to the Fishery coast to work among the *Paravas*. The *Paravas* had been baptized but for their names no other change had taken place. Xavier organized their religion by setting up its churches. He returned to Goa in 1543. The Jesuits were most active on the West Coast, where the Portuguese *Estado* was active. Japan and China, as well as the subcontinent was its range of activity. Malabar was formed in 1601. The priests of the order were generally European. They came with every fleet from Lisbon. However most lacked the education the Jesuit prided themselves on. There was the impression

³ Afonso Correia, *The Jesuits in India 1542-1773*; Studies in Indian History and Culture, Heras Institute, 1997 Gujarat Sahitya Parishad.

that Indian priests would not be good at the job and so there was a dependence on Europe for priests. In the year 1576 the intake of Indian Priests was stopped. However the first Indian convert had already been ordained as early as 1560, Peter Luis was a Brahmin from Kerala and had been taught in Goa.

Xavier went to Malacca in 1546, and was back in 1548. New areas Bassein, Mylapore and Quilon were explored and missions were established there. Xavier's next trip was to Japan. Xavier was finally appointed Superior in 1549 on his return from Japan.

The Jesuits were friendly with the rulers of Vijayanagar, which meant uneasy terms with other regional powers of the period, especially Bijapur. The decline of the Vijayanagar Kingdom was among the many reasons for the happenings explained in chapter IV. The advantages of local rivalries also accrued to the Jesuits as in the Conflict of Martanda Varma, of Travancore and the Perumal of Tuthukudi. These were among the few instances of the Jesuits working in the interiors during the period.

Xavier had performed a major role in the setting up of the society in the East, something that was really big in its scope, considering the vast area of its operation and lack of communication. However, this was marked by a lack of appreciation and understanding of the Indians and

the new converts, something that can be explained as due to the interference of the Portuguese and the objectives of such a situation.

The next stage of working India saw the arrival of the first 'India-Scholars' the people who went about translation, assimilating and exporting knowledge of India to the West. Nobili, Beschi and Brito, fall in this category. This was not curiosity, but a principled approach to making one 'learned' in the traditional sense of Brahmnical knowledge. Translation and material collection was a major activity of the period.

Chapter II

Matter, Motion and the Missionary

Among the most interesting aspects of the period in Europe (1550-1700) is the attitude towards religion; this is a fascinating area of research. However the relation of an emergent science with it makes for an even more interesting study. It is as Raymond Tumbleson puts it "the relation between science, the paradigmatic modern intellectual structure; and theology the paradigmatic pre-modern intellectual structure".¹

But this period was one of contests and these structures met in the sixteenth and seventeenth centuries. The resulting outcomes of the period can be studied in three broad phases of an early, intermediate and later interaction of science with religion. The vast field covered by the two is main obstacle in researching them. The recourse is to make a compromise. Within the limited scope of this chapter we shall only be looking at the representative philosophers/scientists (the differentiation not having emerged yet is another confusion). The representatives taken are Bacon and Galileo(1564 -1642) for an early phase, Descartes for the

¹ Raymond D. Tumbleson: The Science of Anglicanism, *Journal of the History of Ideas* vol.57, No.1, 1996, p.131. Tumbleson however takes off on the Weber-Merton Protestantism-Modern Science thesis and reviews the literature of Charles I and James II, the rise of anti-catholicism its' relation with reason and folds its back into the Weber-Merton thesis.

intermediate phase and the societies of science for the later period. Descartes and Bacon also stand out as philosophers for the 'Method' on which the later phase is built.

The method was a necessary and central theme of the scientific revolution and general procedures were devised for operations on and examinations of nature. This was also because the system of knowledge was beginning to be based on experiment and mathematics. Also since this was not regulated by a body or authority, it tended to, as Bernard Cohen says, be one of the 'greatest democratizing forces in the history of civilization'.² This attitude opened up an entire area to amateurs and the obvious burgeoning of information.

It was among the biggest developments that science was increasingly looked at as that body of knowledge and facts that have not yet been falsified. Truth which had been up until now the great 'given' of religion backed by the books of God and his revelations, was now being 'proven'. This proof involved the showing of the lack of a negative instance. This search for the negative instance, Bacon's '*Major est vis instantiae negativae*', was what dominated the later science. The initial attempts being just an accumulation of facts. The diversion to searching for the falsifiability was the biggest threat that organized religion faced, encouraging as it did the tendency to question. Thus what started out as

² Bernard Cohen., *Revolution in Science* Cambridge, Belknap Press of the Harvard University Press, 1985.

a search for 'truths' ended up questioning established notions of religion and its versions of truth as 'given'.

The distinction of the technical from the scientific is also one aspect of the period, a separation that put the scientist "among the clerks on the side of the rulers".³ This persistent connection of science with the elite had 'condemned science to sterility and technique to repetitive stagnation'.⁴ The break from 'sterility' was to come, as Bernal says, only from a breakdown in the normal connections of the elite to science. Reason was to become the biggest 'democratizing force'. Trading communities had begun emerging in a big way during this period in Europe; and initially almost all major inventions of the period had something to do with the demands of navigation and trade. Examples of navigation related inventions abound in the period.

Apart from religion's keepers; the other elite of the period were the philosophers. Their relations with the groups of the traditional elite, especially the religious elite is interesting and in this particular study the Jesuits. This exhibits a 'breakdown' that makes for a 'mutual stimulation of scientist and craftsman'.⁵

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³ J.D. Bernal., *Science in History*, Vol.4, Pelican 1965, p. 1220.

⁴ *Ibid.*, p. 1220.

⁵ *Ibid.*, p.1220.



Among the most representative of Bacon's (1561-1626) concepts for a science in the period is the Utopian '*New Atlantis*' which appeared at the end of the volume containing Bacon's *Sylva Sylvarum* or Natural History which in some ways reflects the understanding and approaches towards new knowledge. Its structure is that of a standard piece of adventurous fiction, that was popular in the period. Almost dreamlike it starts out with a sea voyage characteristic of the age of exploration, with promises of great discovery. The sea journey is drab and featureless save the occasional doubts that plague the travelers, but this is soon drowned in a deluge of impressions - the total contrast. Bacon has, as is very evident, used the technique of his period, the land for the fantastic, far away from home - a safe distance. This is also in keeping with what he wants to introduce.

The travelers are welcomed by the natives, but then there is a quarantine. The reader is thus welcomed by a quarantine, a quarantine that ensures and entails the dropping of most of the reader's notions itself. The clean sheet ensured, he goes on, to a very unexpected frame; one that is rather out of place, given that quarantine was supposed to remove everything that carried cultural baggage. The result is to foreground the fact that this frame is indispensable. The entirely unknown island is depicted as Christian. The work has thus been characterized. The religion is the 'given' in the situation; something that Bacon does not question. Bacon had thus chosen to work within the

frame, as it were. At another level it also represents the mind of the day, obsessed with geography, floating in idea but girded by religion.

The major attraction of the island other than its Christian nature is the importance it attaches to its knowledge and its organization. Thus the 'Kingdom of Salomona' as Bacon calls the island has Salomon's house or the college of six days works, another deliberate use of Christian imagery that draws off on the wisdom of Solomon and that the world was created in six days; but the institution here is a college. The contents of the college and its organization is what requires attention. Its ideas fit perfectly with later day societies of science and their activities. The scientists themselves, here called the 'Merchants of light' are members of the college. The activities are detailed in a dialogue between the father of Salomon's House and Bacon. The motive of the college being, as the Father tells Bacon:

The end of our foundation is the knowledge of causes, and secret motions of things, and the enlarging of the bounds of Human empire, to the effecting of all things possible.⁶

This is also among the clearest statements for the purpose of science in the period. The words 'Human Empire' refer to the empire of reason and understanding of the Natural world as opposed to that of

⁶ Brian Vickers(ed.), 'New Atlantis'-in *Francis Bacon: A critical edition of the Major works*, OUP, 1996, P.480.

God. Human empire being a subset of God's empire. Bacon has again set limits to inquiry. There were secrets thus; secrets that were kept in the now familiar way of limiting knowledge to within the society/college and giving out only what was necessary. This implied a hierarchy. To quote:

We have also, as you must think, novices and apprentices, that, the succession of the former employed men do not fail; besides a great number of servants and attendants, men and women. And this we do also; we have consultations, which of the inventions and experiences which we have discovered shall be published and which not; and take all an oath of secrecy, for the concealing of those which we think fit to keep secret; though some of those we do reveal sometimes to the state and some not.⁷

Further there is the lurking fear of atheism in the rise of science, something that Bacon understands:

Experience demonstrates how learned men have been arch heretics, how learned times have been inclined to atheism, and how the contemplation of second causes doth derogate from our dependence upon God who is the first cause.⁸

This is the fear that Bacon had about societies and this to an extent also accounts for the hierarchical and secretive nature of the college. This college had a way of going about things; as is said:

⁷ Ibid. P.487.

⁸ Ibid., The advancement of learning, Book I, pp.122-123.

When the king had forbidden to all his people navigation into any part that was not under his crown, he made nevertheless this ordinance, that every twelve years there should be set forth out of this kingdom two ships appointed to several voyages; that in either of these ships there should be a mission of three of the fellows or Brethren of Salomon's House; whose errand was only to give us knowledge of the affairs and state of those countries to which they were designed, and especially of the sciences, arts, manufactures and inventions of all the world; and withal to bring unto us books, instruments, and patterns in every kind; that the ships after they had landed the brethren, should return; and that the brethren should stay abroad till the new mission. These ships are not otherwise fraught, than with a store of victuals, and good quantity of treasure to remain with the brethren, for the buying of such things and rewarding of such persons as they should think fit.⁹

Among the most noticeable aspects of the passage is the nature of the funding and the nature of the duties of these 'merchants of light' the collection and acquisition of mechanics, sciences, arts, manufactures and inventions, along with books instruments and patterns. This was the first step towards the understanding of 'secret motions of things' and this also was the first step towards a method - the collection of data. This definition only fits in with missionary enterprise in the period, as Bacon probably intended it to. Along with the pursuit of trade and religion was now this third category, the pursuit of knowledge. Whereas his other major ideas were set out in expressly philosophical papers, the *New*

⁹ Ibid., *New Atlantis*, pp.471-472.

Atlantis is one of fiction. Which itself points out the difference and gravity of the theme he was dealing with.

Bacon by advising the collection of data and experiment was advising the bridging of the two streams looking for a compromise; experience and experiment. Finally what remains is the all-Christian nature of the enterprise, and Bacon's refusal to break with it. To quote Bacon again:

To conclude therefore, let no man, upon a weak conceit of sobriety, or an ill applied moderation, think or maintain that a man can search too far or be too well studied in the book of God's word or in the book of God's works...¹⁰

Bacon thus steadfastly refused to admit to a break in the objectives of the new quest and as this fit in well with the ethos of the period, therefore there appears no conflict.

This happened only with the arrival of Galileo and his work. Attitudes towards Galileo and the change of the relationship involved the breakup of the cozy relationship of science and religion. However even Galileo followed Bacon in his attitudes towards God; however he went further on the differentiation between the words of God and the works of God.

¹⁰ Ibid.,p.126, The Book or God's words, religion and revelation and the book of God's works being nature.

.. I may deduce this doctrine; that in the books of the sages of this world there are contained some physical truths which are soundly demonstrated, and others that are merely stated; as to the former, it is the office of the wise divines to show that do not contradict the holy scriptures. As to the propositions which are stated but not rigorously demonstrated, anything contrary to the Bible involved by them must be held undoubtedly false and should be proved so by every possible means.

Now if truly demonstrated physical conclusions need not be subordinated to biblical passages, but the latter must rather be shown not to interfere with the former, then before a physical proposition is condemned it must be shown to be not to interfere with the former, then before a physical proposition is condemned it must be shown to be not rigorously demonstrated- and this is to be done not by those who hold the proposition to be true, but by those who judge it to be false.¹¹

The tension in the passage of an emergent science wanting to separate is one that became stronger later. Galileo's implicit acceptance of the 'Negative instance' is also to be noted; that a proposition should be proved false (*and thereby a statement that cannot be proved false is scientific*) by those who judge it to be false. Having already set the limits by professing to not go beyond the 'word' he transferred the onus of the work onto religion's keepers, and thereby achieved an amount of intellectual freedom for himself.

¹¹ Stillman Drake Tr., *Discoveries and Opinions of Galileo*, Double Day Anchor Books, New York, 1957 p.194.

This was also an appeasement to those who sat in judgment. What put him on the wrong side of the Jesuits was his debate on sunspots with Father Christopher Scheiner - a Jesuit professor at the University of Ingoldstadt. The Jesuit had written to Galileo through Welser (a wealthy merchant of Augsburg) under the pseudonym Apelles. The debate over who observed sunspots first soon transforms into the publishing of a tract in support of the Copernican theory in Rome in 1613. (Also see figure)

Further the distinction between experience and experiment was also stressed by Galileo:

I think that in discussions of physical problems we ought to begin not from the authority of scriptural passages but from sense experiences and necessary demonstrations; for the holy bible and the phenomena of nature proceed alike from the divine word, the former the dictate of the holy Ghost and the latter as the observant executrix of God's commands.¹²

These two scientist philosophers are what constitute the early phase of relations with religion of an emergent science. The total acceptance of God and the distinction of God's 'word' and 'works' gave some room to these early practitioners of a 'science'. The Jesuits meanwhile were one the keepers of the religion. The developments posed little or no threat to them until the divide between religion and its keepers was made in the next and intermediate stage.

¹² Ibid., p.182.

sicut & alia innumera vmbra lunulis obiecta, & ipsa Luniformes, ex obiectu paruum eminentiorum creatz. *Tertio*, Lux Lunae ab antiquis maculis distincta & ipsa inaequalis, nam quaedam quasi gemmae ex ea elucent intensissimi candoris, quali est N & O, Lu-



nula item apud H, spud I, ad K, iuxta L, M & D, aliaq; gemmae innumera. *Quarto*, Macula nigra, ut P, Q, R & aliae hinc inde, exq; factis stabiles. *Quinto*, confinium lucis & umbrarum, quale nunc est, S, T, V, X, semper anfractuofum asperum & inaequale, quod cau-
sant partes eminentes lucem solarem inaequaliter impediennes.
Sexto vmbrosa Lunae pars X, Y, S, tota lucida est, luce secundaria, & splendori Saturnio par, de qua mox disquisitione sequente. *Septimo*, huius ipsius partis vmbrosae triplex invenitur lucis differentia: nam ordinaria.

This is a page from Christopher Scheiner's works about the moon. Also Known as 'Appelles' he corresponded through Welser with Galileo on the nature of Sunspots, leading finally to the fallout of Galileo with the Church.*

* Photos available at <http://www.luc.edu/libraries/science>, the Loyola University of Chicago as on 26-6-98.

What makes Descartes the representative of this intermediate phase was the resolving of God into his understanding of science. This was to leave the Jesuits and other traditional 'keepers' out. Also since the intellectual scene of the day was dominated by the Jesuits, who happened to be members of universities and teachers, Descartes needs to be looked at. Descartes system depended a lot on God, but then as an idea. God itself was something beyond comprehension, as he wrote to Mesland, in 1645, February.

.... Since the council [of trent] does not say that it [the idea of God] cannot be expressed in words, I will venture to tell you here in confidence a manner of explanation which seems to me very elegant and useful for avoiding the calumny of heretics who object that our belief on this topic is entirely incomprehensible and involves a contradiction. I do so on condition that if you communicate it to anyone else you will please not attribute it's authorship to me; and on condition that you do not communicate it to anyone at all unless you judge it to be altogether in accord with what has been laid down by the Church.¹³

Even the idea that Descartes used was borrowed from the Church, of God being scarcely expressible in words. The letter above is a late one, one that followed his 'quibbles' with the Jesuits. Hence it would have been thought that his attitude would not have conceded as much to the church as he did in the above letter. This difference or the lack of one in

¹³ Anthony Kenny tr., ed., *Descartes: Philosophical letters* Blackwell Basil 1981. Descartes to Mesland, 9 feb. 1645, p. 154.

Descartes is understood from his earlier letters. As for example in the letter to Mersenne (10th May 1632). He wrote of the church taking on Galileo and what he thought of it. It also shows the measures he took to conform:

Though I thought they were based on very certain and evident proofs, I would not wish, for anything in the world, to maintain them against the authority of the church... I desire to live in peace and to continue the life I have begun under the motto '*Bene vixit, Bene Qui Latuit* (to live well one must live unseen)¹⁴

The tone was one of resignation but also one of resolve for the wishes of the church. As the letters depict, his respect for the church remained; though the 1632 letter shows his acceptance of the church itself and in 1645 he is seen abiding only by what is laid down in 'words' by the church. There is a slight trace of the characteristic of the period, the distinction between the church, its keepers and God.

This distinction is manifest in Descartes 'quibbles' with the Jesuits. In 1640 this was precipitated by the Jesuit Pierre Bourdin objecting to his writings on optical theory. These objections known as the *Seventh Objections* were sent to Descartes through Mersenne. He did not have these quibbles earlier as he says in 1637, after the publication of 'Discourse' and 'Essays', whose copies were sent to the king of France,

¹⁴ Ibid., p. 25

Cardinal Richelieu, Prince of Orange and the teachers of the Jesuit college at La Flèche,

I will be glad if the Jesuit to whom you have recommended my book writes to me about it; whatever comes from the men of that society is likely to be well thought out and the stronger the objection he puts forward, the more pleased I shall be with them.¹⁵

By 1640 this cordiality had turned into one of resolve, of fighting the Jesuits; writing to Mersenne, Descartes said:

I have not yet had my five or six sheets of metaphysics printed, though they have been ready for some time. I delayed them because I do not want them to fall into the hands of Pseudo-theologians nor, now, into the hands of the Jesuits whom I see I shall have to fight before I have had them seen and approved by various doctors and if I can by the Sorbonne as a whole.¹⁶

Descartes then sets out to undermine the base of the Jesuits, that of a tradition of teaching, by writing another textbook as an alternative to the Jesuit texts on philosophy, as reflected in his letter to Mersenne in Sept. 1640:

I will not travel this winter, because in the next four or five months I am due to receive the objections of the Jesuits, and I think I should hold myself in readiness for them. Meanwhile I

¹⁵ Ibid., p.23.

¹⁶ Ibid., p. 70.

should like to re-read some of their philosophy which I have not looked at for twenty years¹⁷

and later; [31 Jan 1642]

... four or five days ago I received the papers of the Jesuits. It is now a prisoner in my hands and I want to treat it as courteously as I can; but I find it so guilty that I see no way of saving it. Everyday I call my council of war about it and I hope that in a short time you will be able to see the account of the trial.

Perhaps these scholastic wars will result in my 'World' being brought into the world. It would be out already. I think, were it not that I want to teach it to speak Latin first. I shall call it 'Summa Philosophiae' to make it more welcome to the scholastics, who are now persecuting it and trying to smother it before its birth. The ministers are as hostile on the Jesuits.¹⁸

Descartes also ensured that his ideas of science did not cross the limit, of questioning god by sourcing all his arguments from God. He also distinguished between the 'words' and the 'works'. Writing to Mersenne:

Your question on theology is beyond my mental capacity, but it does not seem to me outside my province, since it has no concern with anything dependent on revelation, which is what I call theology in the strict sense; it is a metaphysical question which is to be examined by human reason, I think that all those to whom God has given the use of this reason have an obligation to

¹⁷ Ibid., Descartes to Mersenne, 20 Sept., 1640, p.84.

¹⁸ Ibid P. 89.

employ it principally in the endeavor to know him and to know themselves,

... However in my treatise on physics I shall discuss a number of metaphysical topics and especially the following. The mathematical truth which you call eternal have been laid down by God and depend on him entirely no less than the rest of his creatures. Indeed to say that these truths are independent of God is to talk of him as if he were Jupiter or Saturn and to subject him to the Styx and the Fates. Please do not hesitate to assert and proclaim everywhere that it is God who has laid down these laws in nature just as a king lays down laws in his kingdom. There is no single one that we cannot understand if our minds turn to consider it.¹⁹

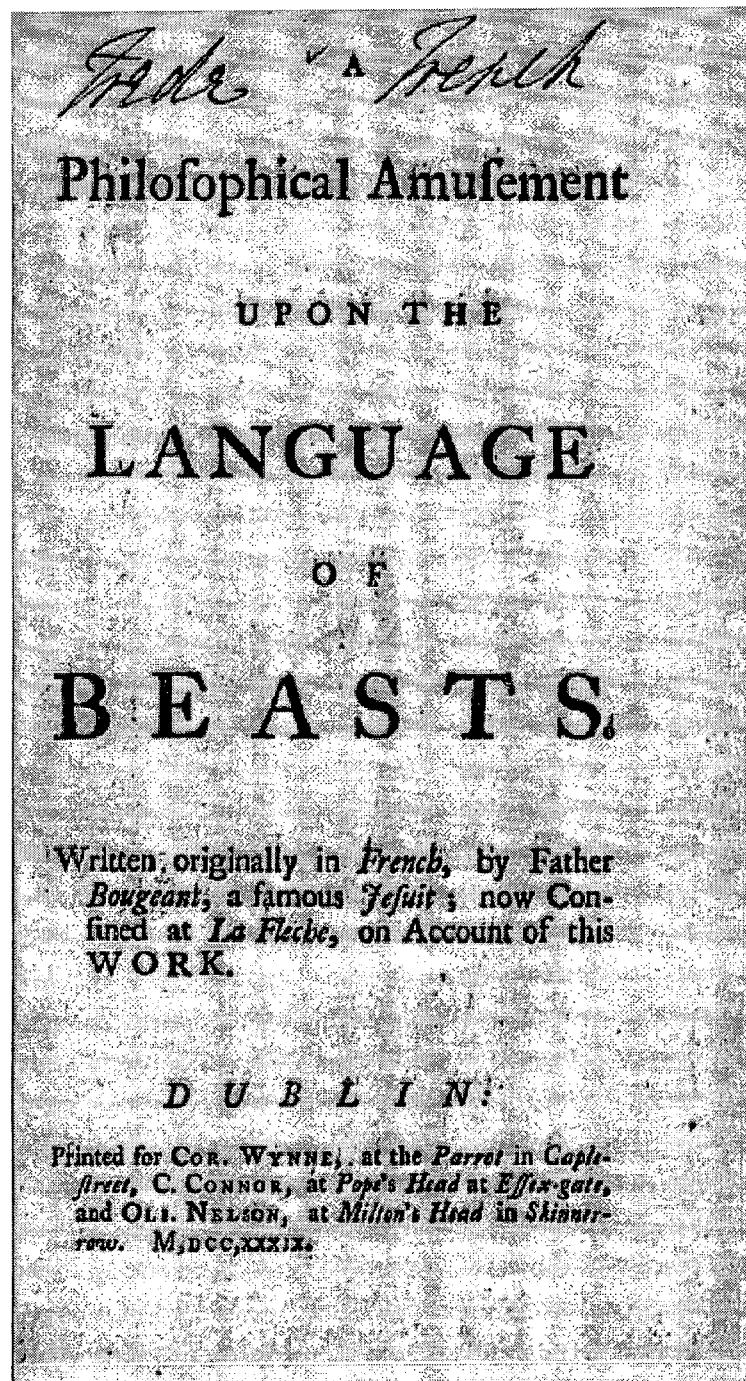
Descartes was aware that he was knocking at the outer limits of accepted norm of not questioning God which the debate required him to ask,

I was afraid that weak minds might avidly embrace the doubts and scruples which I would have to propound and afterwards been unable to follow as fully the arguments by which I would have endeavored to remove them.²⁰

This method of Descartes, the skepticism, put his work on bad terms with the Jesuits and their defenders. Pierre-Daniel Huets' *Censura philosophiae Cartesianae* criticises Descartes for this. Huet's main objection to Descartes being the fact that he doubted the validity of Catholicism

¹⁹ Ibid., p. 8.

²⁰ Ibid., Descartes To Mersenne 27, feb,1637, p. 31



A little lightheartedness with the philosophies of Descartes had made the Jesuit write this work on a possible language of the Beasts, It however got him into trouble as can be seen on the cover.*

* Photos available at <http://www.luc.edu/libraries/science>, the Loyola University of Chicago as on 26-6-98.

before proving it 'true'.²¹ Huet argues that Descartes should not have doubted it in the first place; and the method should have been of assuming it was true and then proving it was; more like what Bacon did in setting his story on a Christian Island. But this was not to mean that Descartes did not have an impact; in fact some Jesuits too were on his side and even accepted Cartesianism, as did Fr. Andre; for which he was imprisoned in the Bastille. Jesuit opposition to Cartesianism finally led it onto the Index; in 1663.²² Cartesianism however found adherents among the Oratorians, an order characterized by its rivalry to the Jesuits²³ founded in 1611 by Cardinal de Berulle.

Descartes was important in the crossing of the two phases, of a church sanctified science and a science that the societies practiced and the church contributed to. Matters had now come to a point where the keepers of religion were questioned; a step below the stage where science would peg itself higher than religion. The Jesuit was one of the many threatened by this development. The third stage, that of societies was the stage, that finally foregrounded it.

Bacon had already built the ideal of scientific society. Among the earliest societies was the *Academia dei Lincei* or the academy of the lynx

²¹ The Cambridge companion to Descartes. Ed. John Cottingham, 1992, p. 409-410

²² Ibid., p.396.

²³ Ibid.,p. 400.

eyed; Galileo was a part of this institution. Another society was Academia del Cimento 1657-1667, under the patronage of the Medicis, which also came out with a Journal the *Saggi di Naturali Esperienze* (1667). The true scientific societies in the Baconian ideal were the Royal society of London and the *Academie des Sciences* in France. They were given state patronage and Funds for research.

The Royal society had adherents to every major sect but the move prominent among them went to great lengths to demonstrate the religious affinity of an approach to natural philosophy. The approach was to involve God also in the explanation. God was beginning to be 'studied', albeit only explanatorily. This study meant the study of God's powers as Providential Ordinata and Providential Absoluta; Special Providence and General Providence i.e., as Gods action in the original creation and special providence as recurrent interventions. Thus managed, there was no conflict and no stepping over the line of Bacon, the questioning of God.

The single negative instance in the method was probably the method's most important achievement, this was responsible in a large measure for the rise of modern science. As we saw this was beginning to question religion. The response of religion was the internalization of this single negative instance by it in the development and deployment of the idea of the miracle. Recurrent interventions were observable but unexplainable events. The neatest arrangement of these arguments is seen

in Newton's theory of gravity and its explanation. The general operation of gravity and its initial creation were traced to the 'six days' and General providence or the powers of God to make. But its continued operation was miracle or special providence, but an explanation of why this attractive force did not make the heavenly bodies collide into each other was not yet seen or understood this was the hand of God - Special Providence. The incorporation of similar arguments into explanations also obeyed the Baconian line. This was the 'Scientific miracle', a fact that was both rational and miraculous at the same time, 'Newton's Synthesis'.²⁴

The Jesuit too cooperated with this enterprise and the Philosophical transactions of the Royal society acknowledges the effort. This fact was apologized for by Henry Oldenburg, the society's first secretary, in a note to his anti-Jesuit readers. Talking of the Jesuit he said,

[The Jesuits] whose goal is to propagate their faith, enrich themselves with their craft. But, to recompense their destruction, Jesuits send useful intelligence from all parts of the world.²⁵

The Jesuit had a role to play in Protestant England's Royal society of Science and even built a sundial for the king, in his Garden, in 1669.²⁶

²⁴See James E. Force., 'Hume and the relation of Science to religion among certain members of the Royal society' *JHI.*, 1984, p. 517.

²⁵ Joseph F. Macdonnell S.J. , *Jesuit Family Album Sketches from the Early Society* - Easter 1997 Published by the Clavius Group, introduction.

²⁶ *Ibid.*, p. 8.

That the Jesuits were working even within the institutions of Protestant England is some thing that shows the changed nature of the Jesuit enterprise. That they were beginning to be considered within this community of emerging science in an ideologically opposite environment shows the character the emergent science and the Jesuits' attempts at lessening of the gap between themselves and this knowledge. Thus it was important as a new space of activity for the Jesuits. But for science this was just one of the many ways in which it overrode distinctions.

This aptly shows the role of the Jesuit, that of contribution and data collection from around the Globe. The space for the third quest, the quest for knowledge within the ambit of the negative instance, i.e, science, had been made but the space was not yet vacated by its previous occupants, the keepers of religion. In fact they continue to occupy it, a position of much relevance as we shall see.

The system built up until now was thus researching something that was second only to God. The general laws and explanations had this single loophole, the single negative instance, a negative instance that did not disprove a truth but only accorded godly sanction to the project. It was expected to pacify the church. This special 'negative instance' was the seal of approval. Thus the Royal Societies were beginning to peel back the final layer off science. God was being given a ceremonial status in the institution and it's work. This had other implications for religion as we

shall examine. This was the third stage; pretty soon, mention of God invited laughter in the Royal society.²⁷

Missionary writings in the period were a mixture of the fantastic and the disapproving. The book itself had come to occupy an important place in society especially after humanism. The written word was taken seriously, and its earlier sacred position had given it a power. Bacon's '*Nullius in verbo*' or 'nothing in the word', which was intended to mean the release of thought from philosophy. This also meant the full use of the senses to the same end, that of observation. The effect was however of undermining the earlier basis of thought that the book represented - tradition. This was exactly what the Jesuit was recommended for by the Tridentine - the keeping of tradition. Tradition and revelation were the bedrock of Christian knowledge. Bacon had made it move. This movement was towards the 'proved fact' through the use of the 'negative instance'.

The change over from the primacy of experience/accumulation of experience on knowledge, i.e., tradition, to the primacy of the proved factoid, the truth of which rested on the fact that it did not have a negative instance, had made experience a poor excuse for knowledge.

The Christian church had for long carried out missionary activity into areas other than Europe; the basis of which lay in the fact that this

²⁷ James E Force., Op.cit., p. 521.

corpus of tradition-based knowledge could be transferred; Christianity was thus the sum total of the experiences of the West. The change had started questioning the missionary; his methods and whether such tradition could be transplanted onto cultures with a different 'experience'. The questioned missionary was the first big problem that rose from this phase. But then there was still the line of Bacon.

This was a very insecure situation for the Jesuits, and the missionary orders understood the dangers of such a line of thought. Co-opting into the line of thought would give them some power, but at their own expense. They would be the ones to make the compromise. The other option was to oppose the new development, that would however lead however to the precipitating of the new body of knowledge, again at the missionary's expense. The other way was of levering the present position into a position of advantage. The missionary however still had one card, that of censure and the 'gently persuasive' powers of a single persecution. As in the case of an early Descartes, in the light of Galileo. The power was that science was still a subservient branch and hence it was considered mouldable.

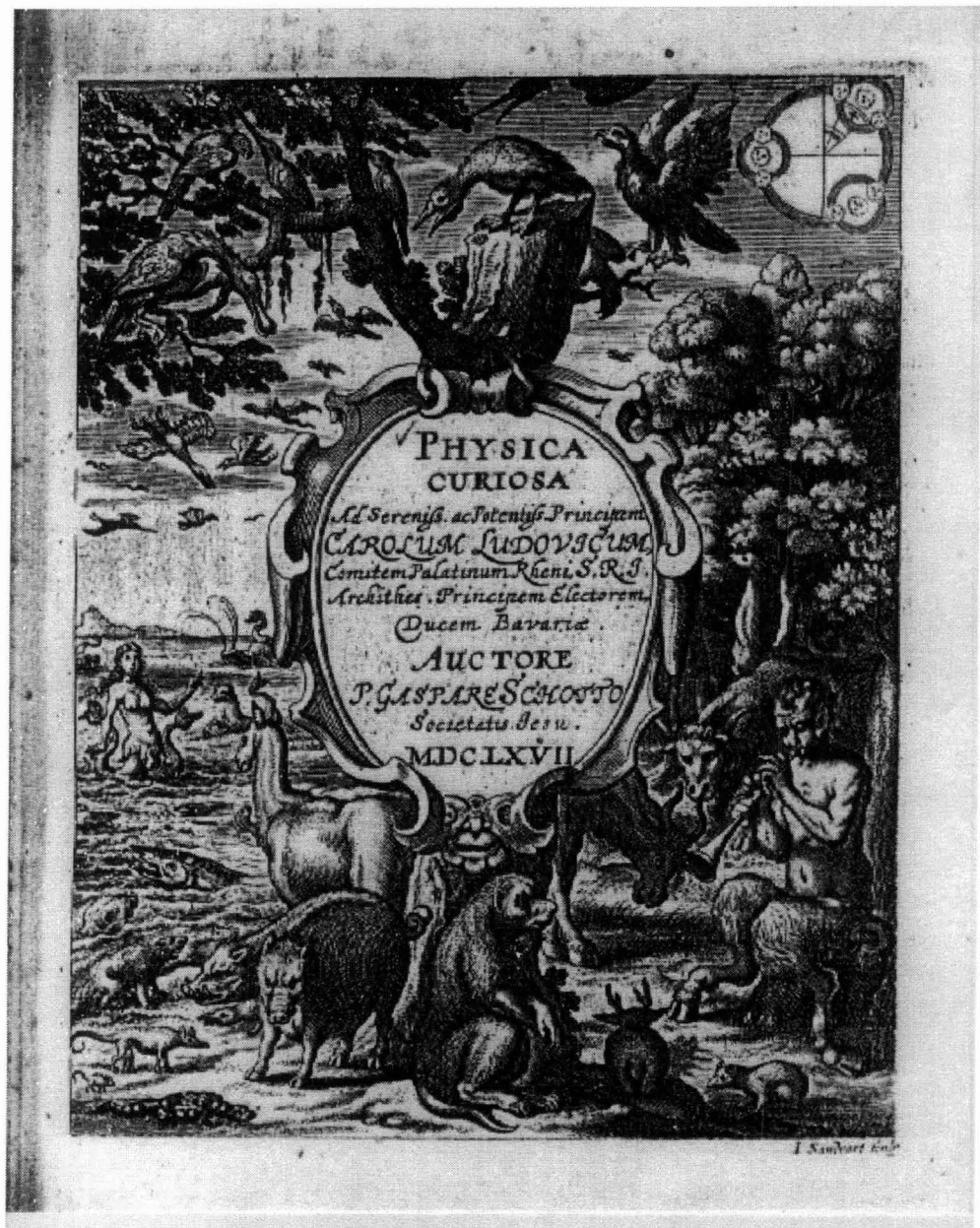
The isolation of the missionary in the Cartesian phase and the gap engineered between God and the keepers of his faith, by the sidling up of science towards an involvement of God in explanation made the situation a tough one for the missionary.

The contributory phase of missionary activity, the involvement of the 'keepers' as contributors and the last traces of the 'miracle-negative instance' Newtonian synthesis gave this group some justification for an involvement. Although ceremonial, the missionaries still retained the power by their association with the society and the church. Being sole intermediaries between there two, was a privileged position; a niche that only the missionary could occupy. It was also at this time that the first scientific journal run by the Jesuits came into being, in 1701, the *Journal de Trevoux*.²⁸

However their experiences in Europe had moulded their attitudes and their use of reason. This reason combined with their niche make for some interesting uses of the east in the west and the west in the east. Some of these attempts gave them the leverage they wanted. An example is the use of the miracle and its roles as a validator and demonstrator of special providence.

Notes and observations of things natural and unnatural turned up in letters and accounts. Miracles and other such divine phenomena were retold. The two types of Miracles pre and post conformity with the societies is another aspects of missionary observation. The latter

²⁸A.C. Crombice and Michael Hoskin: *The Scientific Movement and the diffusion of scientific ideas 1688-1751 in the New Cambridge Modern History*. Vol.VI ed. S. Bombay.



Jesuit interests had shifted in the later half of the seventeenth century into a collection of curia, seen here is a book *Physica curiosa, sive Mirabilia naturae et artis libris XII.comprehensa...*the Influence of Kircher is seen in such efforts. The attempts at mapping variation. (see infra., conclusion.)¹

¹ Photos available at <http://www.luc.edu/libraries/science>, the Loyola University of Chicago as on 26-6-98.

observations were of deviations and of things out of the ordinary (Figure). As in the work of Althanasius Kircher.²⁹

Miracles were unexplainable, part of God and made no change in the general laws framed, however it gave a special power to religion. But even this, changed over the period, as mentioned above. The change was because the scope of the Miracle had been narrowed down, the use of which was unlimited because of a lack of definition of a miracle and the earlier tendency to keep of religion issues, especially God. As the Miracle came to be set within the confines of special providence reporting became mundane. Among the first definitions was that of St. Augustine who said that they were not contrary "to nature" but to "our knowledge of nature".³⁰ As a result earlier miracles were centered around the impact it had on the observer, later however it began being centered around the lack of any explanation. It was the implementation of the 'Method' on Miracles and transferring of judgement on 'reason' and sense 'experience'.

The accounts of miracles soon became a collection of variations; and the best place for such a collection were the territories the missionaries worked in; India was one of them. This also helped religion maintain its last holds on science. Tenets of religion that escaped reason

²⁹ Available online from <http://www.luc.edu/libraries/science> The Science Library / Loyola University of Chicago. accessed 21-6-98.

³⁰ See., Peter Harrison, 'Newtonian Science, Miracles and the laws of Nature', *JHI*, 1995.

were now possible, and could be defended. A large number of miracles by a single person, all single instances and hence not verifiable, kept this hold.

This final stage of an appropriation of the 'reason' it had attempted to keep at bay, had many uses. This reason of words was what the Jesuits thought had achieved the large number of converts, the reason that was, before 'words' finally began to lose value.

The emergence of reason as a norm for debate and of comparisons especially of religion is seen starkly in the period. Thus Catholics and Protestant polemicists both claimed 'truth' arguing their view to be the best, being supported by 'rational' argument. They had however another duty, that of not letting it get out of hand; for reason after Bacon had made the words of God, and the primacy of tradition and revelation, increasingly unstable.

This is explored in an article by Susan Rosa.³¹ The document used is a text in which a Jesuit, a Lutheran and a Confucian philosopher debate on the true religion. The text itself was written by Vitius Erbermann, and this text, the 'Dialogues among a Lutheran theologian a Jesuit and a Chinese Philosopher' is demonstrative in its use of the new rationality. This rationality was used to show that the Protestant church lacked the

³¹ Susan Rosa; 'Seventeenth Century Catholic Polemic and the rise of Cultural Rationalism An example from the empire'-*JHI*, 1996.

marks of truth needed to make it a true religion, a distinction that only the Catholic church claims possessed. This rationality was used by pointing to the acceptance of Catholicism in the new lands of Christianity, the east. Its acceptance by the new convert was used as a demonstrator of the new philosophy of the uniformity of truth and of having no variants, variation as mentioned earlier being taken as a mark of falsehood in the light of the negative instance.

What is most interesting in the source that is quoted in Susan Rosa's article is the role of the Chinese philosopher. The purpose of his presence in this argument was that of pure sense, the third man, the one without the burden of either debaters, that of knowledge; to standby and defend. The philosopher thus comes to symbolize rationality-unsullied. This is a feat that is engineered through the construction of an image of the east, by reports that compare and highlight this 'rationality', as opposed to the 'fallen' rationality of the Indian, who adheres to 'the teachings of the 'Devil'. Favorable comparison of the Chinese to the Indian was a regular feature of reports from the east, something that shall be explored in chapter III. The role of the philosopher in the discussion becomes that of the judge, at par with the west. This is further facilitated simply by the trouble that the Jesuit and the Lutheran seem to have with defending religion, which in this case the philosopher does not seem to need.

The construction of the East is thus as a theater for the western mind; where Ideals are sown and the 'unsullied' results easy to observe. This also appeals to the commoner in Europe—a product of humanism, and witness to the rise of rationality—who finds himself represented in the debate by the Chinese philosopher.

This quest made the observations from India, more of searching for a dulled brilliance of an earlier transplantation, and hence a search for similarity; and the letters treat many Indian characteristics as 'fallen'.

To conclude, science had successively encroached on the ground of religion; and the resentment was directed at the keepers, a point that is taken up Weber in postulating the rise of capitalism in the asceticism of Protestantism³², Merton however was to extend it backwards and postulated a rise of science conditional to the rise Protestantism. This debate is taken to the Catholic - Protestant opposition by other authors, like Francis Russo and R. Hooykaas; who look at dissent within religion as 'anti-rationalism'.³³

Science was trying to achieve a break from tradition and revelation, and by wanting to shed its accumulated experience, it

³² Weber Max, *Protestant ethic and the spirit of capitalism.*, tr., Talcott Parsons, Charles Scriber's sons New York 1958.

³³ See., Pledge H.T., *Science since the 1500, A short History of Mathematics, Physics, Chemistry and Biology*, Harper Torch Books, New York 1959.

attempted the first of its changes that would make it easier to transplant across cultures.

Jesuits working in India went through all the changes and compromises above in holding on to their legacy as teachers and knowledge importers. The rise of a western in the light of the shedding of experience, is another question. That some of the 'method' did indeed seep through is true; but as we shall see, in Chapter III & IV it was colored entirely different by factors in India.

Chapter III

The Jesuit Between The *Padroado* And The *Prangui*: Problems

The stages of the growth of science in Europe have been detailed with respect to religion and the Jesuits in the earlier Chapter. Europe was the home ground, ground that was being lost. The steady erosion had prompted many changes, adaptations and finally compromises. However we also notice that a definition of science had not emerged as yet, being engaged as it was with contesting religion. The Jesuit therefore could not be expected to have a knowledge of science as we understand it and could only have had an understanding of it through the many factors that seemed to influence them. This Chapter shall not therefore look at science as we know it, but only at those changes that the Jesuits went through in 'transferring' this knowledge. This involves an assumption, that the Jesuits did in fact transfer something to India in the end. The factors that seemed to outline this transfer [of knowledge] by restricting and modifying it would hopefully be understood.

India for the Jesuit was very different, in language, manners and customs. The Jesuits were naturally not in their element here; they were the ones who wanted to make inroads. The Jesuits adopted different methods for their work. It was through compromises and

accommodations that they could initiate their work and progress. Also the situation here was more complex and unstable. The Jesuits also were not acknowledged here as intellectuals as they were in Europe. Therefore it was necessary for them to consolidate the ground they had gained against constant pressure of the Portuguese. The kind of relations that the Jesuits had with the state in Europe was now mediated through the *Estado Da India*. This period also coincides with the early stages of the Jesuits' ventures into India. Jesuits' relationship with other political entities also needs to be simultaneously looked at. A broad understanding of the Jesuits relation with politics and the balance of their interests with their patrons will be one of the aspects of our discussion. A very interesting aspect of the period is the first attempt at institution, the school / college, albeit one that fit in with the Jesuits' concept of an institution in Europe at the time. The school thus is the important ground, for contests of 'knowledge' and for the training of the contentions. Its role with respect to the fostering of science also needs to be looked into. As a sequel to this we notice the emergence of the Baconian method in the court of Sawai Jai Singh, another place of Jesuit activity, the theory of the Jesuits having to do a bit with this effort needs to be understood¹.

¹ V.N. Sharma, *Sawai Jai Singh and his Astronomy*, Motilal Banarsidas, Delhi, 1995. The work of V.N.Sharma is the most detailed in this in this area, and we shall have to rely on it to a large extent, (due to certain very familiar constraints) to understand the work of Sawai Jai Singh.

The nature of science that emerged out of these conditions, both in Europe and in India, was invariably colored by its local traditions. Its roots lay in the events that we follow.

Science's relationship with patronage is one area where it is subservient to interests other than its own. An understanding science is possible through understanding its nature. Each period is thus characterized by the knowledge it operates with and operates on, thereby changing it. An assumption that the missionary did bring about a science to India needs to be looked into with respect to its system of operation and also how the Jesuits themselves, holders of this knowledge were transformed by it. The other important force of the day², apart from religion was trade. Trade had made Portugal one the busiest states in Europe. Royal patronage, which the Jesuits also enjoyed, was in a large measure responsible for this. The active association of the Jesuits with trade and trading parties had given the world new insights and theaters of imagination, something akin to the '*New Atlantis*'. Prince Henry known as Prince Henry the Navigator, was among the most passionate of the people who were causing the borders of this imagination to creep outward. This imagination had its workers, the innumerable searchers of fortune who wound up along these frontiers. These frontiers had seen the

²As mentioned in the preceding chapter the other forces were religion and an emergent science.

Arabs earlier. The result of meeting the '*moors*' who were also working their imaginations outward had seen the crusades and the stopping of the west's imagination. But they had seen the faint outlines of horizon beyond the '*Moors*', in the accounts of travelers, straggling lone traders coming in over the mountains and the occasional tales by the '*moorish*' traders. The obstacle gave way with the discovery of a sea route to India. It was time for the imagination again.

The effort, carried on at such vast distances, needed cooperation and planning and the people involved in this advancing of the frontier were almost independent in the new territories. Since it was a time of contesting ideas, the removal of the direct hold of the state over them meant these held-in-check ideas now vied for a larger share of the spoils of this imagination. A common history also meant that their objectives were similar, but not nearly so. The conflict with the '*moors*' had left them with vivid memories; the traders and the missionaries cooperated in some areas.

The conflict of the two most important forces, trade and religion, had seen the Crown of Portugal come to a compromise, that of rolling these two into a single entity in the Portuguese enterprise in the east. This situation was a compromise, not a solution. Other avenues of regaining their respective independence would be sought. But even from the beginning the situation was tilted in favor of the trade, being the financier of the idea - religion.

The Portuguese had taken over the fishery coast from warring groups on the coast and now had access to the rich revenues from here. Goa was taken over in 1510 from the Sultan of Bijapur and was responsible for hostile relations between the two. This was a situation that put the Jesuits under two masters, the authority of the Pope and the patronage and goodwill of the king. The crusades and the contact with the *moors* had given the king the valuable lesson of the use of religion as a tool for organizing and influencing of opinion. The Portuguese king used the example in getting the assent and the umbrella of the Pope; with the '*Padroado*'. The Papal bull '*Jus patronatus Padroado*'³ -gave the Portuguese the responsibility of spreading of religion, in these new lands. The imagination being exercised in India and other places was thus an extension of this memory of an earlier contest. Francis Xavier's letters are a major example, and his impressions of the '*Moors*' are almost always predisposed to expecting trouble, and when that did not happen, was pleasantly surprised.⁴

The Jesuits were the religious apparatus of a trading empire. The Jesuits understood this role, but were unhappy with the hierarchy of this effort. They were in good stead with the kings of Portugal, John II (1521-1557) and Sebastian (1557-1578). This encouraged them to complain about

³ *Madura varia*. Vidyajyoti Institute of Theology, New Delhi.

⁴ Costelloe, *The Letters and Instructions of Francis Xavier*, Gujarat Sahitya Prakash, 1993. Francis Xavier writing from Goa Sept 20, 1542, on the island of Melinde-Malindi in Kenya., p.45

their problems that they faced in India where they wanted to carry their work without any kind of control of the *Estado Da India* as can be seen in the letters below.

My Lord:

I earnestly desire that your highness would keep in mind and reflect upon the fact that God our lord has granted the rule over these Indies primarily to Your Highness, preferring you to all other Christian princes, so that he might try you and discover the fidelity with which you fulfill the task which has been entrusted to you, and the sentiments of gratitude with which you respond to the benefits that have confirmed upon you. In doing this he did not so much intend to enrich the royal treasury of Your Highness with the precious fruits of distant lands or through the acquisition of foreign treasures...⁵

That the Jesuits were not fully satisfied with the king's response is also clear in this letter :

Your Highness should begin to make a full and exact accounting of all the fruits and temporal gains which you, through the grace of God, obtain from these Indies. Deduct from this what you spend here on the service of God and the support of the faith. And then, after you have made a prudent judgement about all this, divide these revenues between your earthly kingdom and God and his heavenly kingdom as you, with a grateful and religious mind will judge to be right and just, taking care however that the creator of all things, who has been so generous in granting you wealth, does not appear to be receiving from Your Highness a mean and stingy reward. And Your Highness should not continue to delay and procrastinate any longer, since

⁵ Ibid., Letter from Francis Xavier to John III from Cochin, Jan 20, 1545, p.107.

no matter how swiftly you act, your diligence in this regard will always be late. The true and ardent love which I feel for Your Highness moves me to write in this way, for it seems to me that I hear voices from India rising to heaven with the complaint that Your Highness is dealing stingily with them, since only a very small portion of the abundant revenues which enrich your treasury from here is being given by Your Highness to alleviate its very serious spiritual needs.⁶

These warnings become even more severe:

May our lord grant Your Highness to recognize his most holy will within your soul, and may he also grant you the grace to fulfill it perfectly, as you will wish to have it fulfilled at the hour of your death, when you will be about to give an accounting to God of Your whole life past; and this hour will come more quickly than Your Highness thinks; and be prepared for it, since kingdoms and lordships decline and come to an end. Your Highness will encounter something new, which you will never have experienced before. You will see yourself deprived of all your kingdoms and lordships at the hour of death and entering others, where it will be something new for you to receive orders and, may God avert it, to be excluded from paradise⁷

There was thus a constant urge on the part of the Jesuits to improve their situation through similar persuasions. The other major effort they put their minds at was the improvement of their situation with respect to the Portuguese in India. There was a close co-operation between the society and the military/trading establishments of the

⁶ Ibid., p.109.

⁷ Ibid., Letter from Francis Xavier to John III from Cochin, Jan. 26, 1549, p.237.

Portuguese. The early Governor, Albuquerque was predisposed to help the members of the Society and even helped build a college at Goa, organizing revenue for it and getting it converts.⁸

The Jesuits also for that matter, kept at trying to improve their relation with the local Portuguese. The extent to which they were part of the Portuguese enterprise could be seen by the fact that they were also acting as trade scouts in new places and sent home reports on what to bring to these places so that a profit may be made. Francis Xavier advised this to be done as one of the means of luring the Portuguese into going to places where the Jesuits wanted to.

The one who brings the priests will gain much silver and gold if he brings with him the Goods indicated on this list; and the priests will thus be able to come well armed and equipped for every necessity.⁹

The passage also indicates to an extent that only a lure of trade could get the work done, and the method adopted here of sending in a list only points, indirectly though, to the tension between the Portuguese and the Jesuits. The Jesuits needed the Portuguese too, as Xavier explicitly says when he refers to their strength on Sea.¹⁰

⁸ For details to revenue of the Goa Province and the Finance allocated to the College: See B. Charles J. Borges, *The Economics of the Goa Jesuits 1542-1749*, Concept Publishing, 1994.

⁹ Costelloe, Op.cit, letter from Francis Xavier, Kagoshima; Japan, Nov.5, 1549 to Antonio Gomes, p.316.

¹⁰ Ibid., Letter from Francis Xavier, Goa, India, Sept., 20, 1542, to Ignatius Loyola. p.56.

Portuguese superiority over the seas was used along the coasts to increase the number of converts and to make the region Christian dominated. The Portuguese navy had taken over the fishery coast and its rich pearl fishing areas. This was among the major centres of activity among the Jesuits. As mentioned earlier a lot of converts were made in accordance with the '*Cuis regio, illius religio*' motto followed by the Jesuits. The *Lettres Edifiantes*, a late series of published letters, mentions three sorts of conversions (i) by force (ii) by purchase and (iii) as a means of getting Portuguese protection; especially along the coast. Yet the Jesuits found an indifference, among the converts and aversion among those who were not. The aversion, as many of the Jesuits discovered, was because of two factors, the fear of being branded '*Prangui*' and the impression of the Portuguese among the Indians.

Xavier asked the members of the order to not allow any of their relatives to come to India with Royal Commissions because they would "all go the way of '*rapio rapis*'".¹¹ This was an aspect which generated widely varying opinion about the Portuguese. Among the many complaints to the king the Jesuits repeatedly mentioned about their little control over the provinces where they worked, over the finances and the fact that the Portuguese hardly listened to the Jesuits;

Your Highness should know that in these regions, as in many others, great services frequently fail to be rendered to God our for

¹¹ Ibid., Letter from Francis Xavier to Francisco Mansilhas, Negapatam, April, 1545, p.123.

because of the unfortunate rivalries that exist between different parties, one saying: "I shall do it", and others; "No, I shall", and still others: "Since I am not doing it, I am not happy with your doing it", and others: "I am the one who bears the burden, but it is others who receive the thanks and the rewards". ... This is also the reason why things that would greatly contribute to Your Highness's honor and service very frequently fail to be accomplished in India.

... Your Highness should tell the Governor who is here, or whom Your Highness is sending from Portugal, that you do not rely so much upon any of all the religions who are here as much as you do upon him for the increase of our holy faith in India. If your governor does the opposite and fails to obtain a great increase of our holy faith, since it depends upon his will to do so, advise him with a solemn oath in the instruction which you send to your Governor that you will punish him when he returns to Portugal by confiscating all of his possession for the works of the holy Misericordia, and that you will, moreover, keep him in Irons for many years, freeing him the illusion that his excuses will be accepted.¹²

The constant advice in all letters irrespective of the opinion, about the Portuguese is that the king should treat this mission as an exclusively religious one. This was the state of the Jesuit in a time when they were supposedly supreme in Europe. Like wise they wanted to emerge as the carriers of religion and the fact that they were the sole carriers of knowledge in India. This coincides with the early periods of a science in Europe, the period of almost complete obedience. However the Jesuits

¹² Ibid., Letter from Francis Xavier to King John III Cochin, Jan 20, 1548, p.182

knew that they would not be able to make headway in the interiors of India through the Portuguese.

I must inform your Charity that the Portuguese in these regions rule only over the sea and the towns that are long the coasts; they are consequently not lords over the mainland, but only of places where they live.

The attitude of the Indians native to these regions is such that because of their great sins, they are not at all inclined towards the things of our holy faith, but they rather abhor them and are mortally stricken when we speak to them and ask them to become Christians, although for the moment the Christians who have been converted remain so. Still if the pagans in these regions were very favorably treated by the Portuguese, many would become Christians; but the pagans see that those become Christians are so badly treated that they refuse to be converted on this account.¹³

This does not give the whole picture. The Jesuits performed another important role. They acted as ambassadors, as did Pinheiro in the Mughal court who succeeded in influencing the decision of the Mughal court in disallowing the English to trade on the west coast. By all accounts this was a major achievement. And such cooperation made each indispensable to the other.

The Jesuit was important in China also. The Portuguese were banned from trading in China in 1522 by a public decree. However their

¹³ Ibid., Letter from Francis Xavier to Ignatius of Loyola, Cochin, Jan 12, 1549, p.215.

trade was still carried out on many islands around Canton. In 1547 they were physically driven out as 'Pirates' and their access to the posts were closed. China was thus a closed country. The Jesuits were the only hope of finding ways to China. However even the Jesuits had to get through Japan into China. In spite of these experiences Chinese were praised, even more than the Japanese, by Xavier, as being 'very acute and talented, much more so than the Japanese'.¹⁴ However Xavier does not acknowledge this hostility of the Chinese in his letters. On the other hand "...the demon" Ignatius Loyola said "is greatly upset that those of the society of the name Jesus may be entering into China".¹⁵

By 1564 Francis Perez was already talking about the possibility of an embassy in Canton. This after a lot of difficulty trying to get in. China was even more esteemed by Xavier than Japan because of the difficulty in getting in and the version of Paganism in Japan that they came across. The respect is even more increased by the fact that they too like the Jesuits stressed on learning. Also the Japanese sourced all their knowledge to China. That combined with the attitude to question among the Bonzes lead the Jesuit into this comparison. Talking of China:

China is a very large and peaceful land, where there are no wars.
According to what the Portuguese¹⁶ who are there write, it is a

¹⁴ Ibid., Letter to Francis Xavier to companions in Europe, Cochin, Jan 29, 1552, p.326.

¹⁵ Ibid., Letter of Ignatius Loyola to Francis Xavier, Rome June 28 1553, p.458.

¹⁶ Ibid., Prisoners as Costelloe points out in a note on this letter, p.458.

land of strict justice; more so than any land is the whole of Christendom.¹⁷

This comparison of China with the west and on being better in Justice than 'any land in the west' is the essential line in the statement. The image of China being constructed, of learning, justice, having a single king and lawful, along with its secretiveness makes China a prize to be coveted. The image the Jesuits have of themselves is bettered by the Chinese. Their universities and ideals ring well with the Jesuits. And as Xavier says: "The more learned one is, the more noble and esteemed he is".¹⁸ This makes it imperative that the missionary coming to Japan and China be learned:

They must also be learned in order to be able to answer the many questions that are posed by the Japanese. It would be well if they were good Masters of Arts, and it would certainly be no loss if they were dialecticians, so that they could catch the Japanese in contradictions when they dispute with them. It would also be good if they knew something about the celestial sphere, since the Japanese are delighted with learning about the movements of the heavens, the eclipses of the sun, the waxing and waning of the moon, and how rain, snow and hail, thunder, lightning, comets and other natural phenomena are produced. The explanation of such matters are a great help in gaining the good will of the people.¹⁹

¹⁷Ibid., Letter from Francis Xavier to companions in Rome, Cochin, Jan 29 1552, p.326.

¹⁸Ibid., Letter from Francis Xavier to Ignatius Loyola, Goa April 9, 1552 p.383.

¹⁹Ibid., Letter from Francis Xavier to Ignatius Loyola, Goa, April 9, 1552, p.383.

The emphasis on learning, and contesting of knowledge is what the Jesuits are interested in. The hope of achieving mass conversions through the contradicting of the sects in Japan existed. This situation was different in India. Drudgery of conversion practices along the coast of India, which involved walking from village to village that too under the auspices of the Portuguese, was not considered very encouraging by the Jesuits. To achieve their goals they made attempts to target the heads of sects and other renowned men. It brought mixed results.

It was not that the Jesuits in India did not look for a class of knowledge holders in India. They acknowledge that a similar class of people did exist; 'who are supported by all the Pagans'.²⁰ However as compared to the Bonzes of Japan:

These Brahmans are men of little learning; and what they lack in virtue, they have much more in malice and iniquity... If there were no Brahmans, all the pagans would be converted to our faith.^{21,22}

But unlike in Japan where the only possible way was a debate to get through, the Jesuit in India preferred instead, to preach. This was because the Portuguese presence gave them a captive population to work

²⁰Ibid., Letter Francis Xavier to companions in Rome, Cochin, Jan 15, 1544., p.63.

²¹ Ibid.

²²The qualification of the Brahman here is as a man of learning and as a keeper of knowledge. Thus the Jesuit did understand the groups that were to be contested.

with. Even while converting, the targetted audience were among the non-Brahmin castes. This was in the initial stages of the Jesuit-Brahmin encounter. The fact that the Brahmin held knowledge was acknowledged. But the Brahman on the coast was different from the one in the hinterland. The capital cities had large 'universities' (as the Jesuits called the educational institutions attached to the temple) where the learned members of the same group were found. Added to this fact was the secrecy surrounding their knowledge and the restricted access to the Portuguese associated Jesuits. In fact this lead them to seize the library of a Brahman in 1559 in a lightning raid into Bijapuri territory by the Portuguese.

Another important factor in the access to knowledge was the language. This led the Jesuits to practice the 'immersion' method of learning the language. A priest or scholastic in this method taught himself the language by working in the region concerned using only the local language. Some of the prominent Jesuits who pursued this course included Peter d' Alemeida in Konkani, Henry Henriques in Tamil , and Manuel Gomes in Marathi.

It was only when Nobili broke through the barrier that any significant progress was made in the understanding of the men to be contested; but then Nobili had co-opted into the ranks of the 'knowledgeable Brahman'.

That not many attempts at converting the Brahmins were made is also because they were important elements of local trade in India.²³ The other important objective was Lusitanization - making the new converts as Portuguese through their Christianity. This was only possible in the Portuguese settled areas. The Jesuits were therefore characterized by being 'Portuguese' and as '*Prangui*' among the locals.

What is understood therefore is the fact that this early period of complete association with the Portuguese did not give the Jesuits any major advantages in contesting the local systems of knowledge constrained as they were from making use of their methods of conversion through contest. They only tried for an understanding, through many attempts at learning the language and securing the books of religion.

The Jesuit characterized most Indians as 'black' compared to the Japanese who were a 'white' race. Thus a true moulding of the Jesuits and his neophyte was impossible, leave alone meaningful dialogue and exchange of information. Workers in India did not "need much learning but rather many virtues".²⁴ The only possible meaningful interaction in terms of exchange of knowledge would therefore be in the colleges they established. We shall soon understand why that was impossible. Besides there were other factors that made for a slow decline in Portuguese

²³ Cf. M.N. Pearson, *Brahmin and Baniyas in Coastal Western India*, Concept Publishing co. 1981.

²⁴ Costelloe, *Op. cit.*, Letter from Francis Xavier to Ignatius Loyola, Cochin, Jan.14, 1549, p.217.

fortunes; Spain had annexed Portugal and were beaten by the English Navy in 1588. At the local level the decline and defeat of the Vijayanagar empire with whom the Portuguese had friendly relations, had caused a severe blow to the company's fortunes. Thus an 'anti-Portuguese alliance'²⁵ evolved among the Sultans of Bijapur, Golconda and Acheh and the enforcement of *Cartazes* became difficult. Soon, to add to all their troubles, other trading organizations in the east, the Dutch the English and the Danish companies. The gradual claiming of the Coromandel trade by the new entrants meant the decline of the influence that the Jesuit had. The massacre of Amboyna in 1632 also made the English consider India more seriously rather than the far east.

Thus by the first quarter of the seventeenth century the early steps to an indigenisation of the Jesuit, the indigenisation of the west and the clearing of the early ground necessary for a further reception of its ideas and knowledge had been prepared. That an essential link between patronage and knowledge did not happen in this period is evident. The only patronage being that of a rather unwilling Portuguese state being forced to justify the 'imagination' it had in religious terms.

²⁵ Sanjay Subhramanyam., *Political Economy of Commerce 1500-1773*. Cambridge University Press. 1990.

Chapter IV

Roman Sannyasis and a House for Solomon: Possibilities

There were problems for the Jesuits as we saw in the preceding chapter. These were the early stages. The transfer of knowledge in such conditions can be ruled out. Whether they were willing for such a transfer is another question. The unequal nature of the Jesuits relationship with the population was one of the reasons. This was the period of uncertain identity for the Jesuits. That the preliminary conditions for the transfer of knowledge could not happen in this period is thus understood. But it was not as if there was not a chance for this to happen. There were in fact three very obvious chances, the possibility of the rise of the institution on lines similar to that in Europe, through the attempts at indigenising themselves and thus resolving the problems that they seemed to have of identity, and through the emergence of an indigenous demand.

Before these possibilities are explored it should first be said that the essence of science, the first true signs of life in this body of ideas/ knowledge, that set it apart from the earlier set of ideas, was its 'method'. This particular method as we saw in chapter II had emerged out of a series of contests and compromises that finally saw it separate

itself as a new body of knowledge and thus build its own institutions. These institutions, the scientific societies, were the answer to the earlier institution of the university in which science had taken birth through debates. The intellectual focus of the knowledge that we are now studying thus had its roots in the universities of Europe. That this possibility also existed for India is a fact, but the question about its character still needs to be evaluated. The second possibility asks us whether the indigenisation attempts of the Jesuits did indeed help or prepare the ground for such a transfer. The third possibility of a transfer relating to demand, looks into the character of the Jesuits involvement at the court of the Raja Sawai Jai Singh and the character of the demand itself.

However for the sake of continuity and for highlighting the changes that the Jesuit adopted, the second possibility that of a change in the attitude Jesuits themselves need to be looked into first.

The slow and restricted expansion of the Portuguese influence in the fifteenth century adversely affected the protection enjoyed by the Jesuits as well as in the volume of revenue the Jesuits had access to. Yet it allowed freedom of movement which the Jesuit did not enjoy earlier, of moving into areas beyond the Portuguese influence. This turn of events provided the Jesuits with possibilities of moving with expectations of the prize of converting top-down, from the king and

the religious elite downwards. This was done by the moving into Madurai and also by attempts in the Mughal mission. Another the Mughal mission happened at the request of Akbar in 1579, but the Jesuit soon found that the Emperor's interest was in getting the Jesuit to participate in the religious discussions of the *Ibadat Khana* along with representatives of other religions. The Jesuits however could not make any breakthrough in converting the king. The Jesuits found themselves frustrated and isolated, and they were only allowed to debate with Akbar on religion, and nothing else. This increasing frustration is expressed in many letters to Goa asking for permission to come back. When the Jesuits asked permission from Akbar to leave the court they were refused.¹ This is also the time of the few material exchanges between Europe and India, the Mughal court in particular, with paintings and curia being shipped, as means of gaining favor.²

The Jesuits were however able to establish a college in Agra and Lahore; this was financed by an Armenian Christian³(Mirza Zul Q'arnain) whose fortunes went up and down, as did the fortunes of the Jesuits in the land of the *Mogor* (as the Mughals were called by the Portuguese). However even in the service of the Mughals they were part

¹The Hosten Collection, *A Mughal Grandee of Agra.*, Vidyajoti Institute of Theology, New Delhi.

² Fernao Guerriero: *Jahangir and the Jesuits with an account of the travels of Benedict Goes*, Tr. and Ed. Payne, George Roulledge & Sons. 1930.

³The Hosten collection, Op.cit.

of the Portuguese establishment. Moreover the decline of the Portuguese was primarily due to erosion by displaced powers in South East Asia whose interest was mainly the eastern coast of India. It was here that the Portuguese power started eroding. The Mughal was also weak in this area and hence relations between the Mughals and the Portuguese continued on the same level as before the erosion on the South East because their interests did not collide. The Jesuits' position as part of the *Estado* in the Mughal Court remained unchanged. The earlier cited situation of Pinheiro is an example. They were thus not exactly free to pursue their interests of debating and then converting.

The other effort was in South India where the Jesuits moved inward, towards Madurai. The *paravas* among whom the Jesuits had worked earlier were coastal fishermen, some of them lived at Madurai. The Jesuits took care to save them from the oppressions of both the Portuguese and the Nayak at Madurai. Yet conversions did not come easily. Father Goncalo Fernandez who stayed for twenty long years in Madurai from 1549 to 1569 could not make a single convert.⁴ This was also because he was a representative of the Portuguese establishment at the Madurai court. The year 1606 however saw Robert de Nobili coming to Madurai. Which coincides with the departure from the Lusitanizing policy followed earlier. Nobili decided that a new approach had to be

⁴ Letter of Fr. Nobili, to Fr. Fabius de Fabilis, Oct. 8, 1909 quoted in Sauliere, *His Star in the East*, Gujarat Sahitya Prakash, 1994.

made in breaking the impasse they faced, of being locked in between the identities of the *Prangui* and the Portuguese both of which were unacceptable to the local population among whom the Jesuit worked. This led, as Sauliere says, to Nobili registering a protest against the acculturation and '*Pranguising*' the convert⁵.

This is the first clear indicator of a split between the Portuguese and Jesuits. From this time onwards we see them working in different directions. The Portuguese, as mentioned earlier were now facing increasing challenges from the European trading companies. The developments in Europe only added to their problems.

The Jesuits started to publicly adopt the marks and symbols of 'Indian culture'. The reforms included Nobili donning saffron and claiming royal descent. He further changed himself and donned the 'thread' and distinguished between the high and the low caste converts. He came to be referred as the 'Roman Sannyasi.'⁶ His claiming of the 'non-Portuguese' descent could be considered as a crucial step. There was some opposition to it among the Jesuits. Nobili gave justification for this by explaining the distinction between 'marks of culture', the sandal paste on the forehead, the saffron robes, the thread and the 'marks of religion' to get over the obstacle of the Portuguese-*Prangui* impasse. These

⁵ Ibid., p 43.

⁶ Ibid., p. 44

in fact were to increase his reach among the elite. For the next few years, for obvious reasons the Jesuits had to contend with the accusations of compromising Christianity. The Church accused Nobili of trying to create something new out of the Christian religion by modifying it and of bringing in the caste system into Christianity and implying by his example that only an upper caste convert could practice it within India.

The Jesuits therefore had not resolved their problems yet. The equal footing that they desired with the Indian was proving elusive. The discussions that the Jesuit wanted to do with the keepers of knowledge in India, the Brahmins, was being stifled due to all these pressures. Such discussions were an essential condition for the introduction of a new knowledge into India. This also kept them and their knowledge isolated. A transfer of science in the period was next to impossible for the Jesuit and the rise of the method which the Jesuit was seeing in Europe would not have been known to the Indians.

By 1640 the union of Portugal and Spain had come apart. But by what influenced the whole of India in the mid seventeenth century and later was the question of the Deccan. Worsening equations of power led Shah Jahan to adopt a strategy of conquest in the Deccan, but not complete invasion. Towards the end of Akbar's reign, Mughal interest had shifted southward. Mughal frontiers had expanded to reach the Krishna in 1599, and also Khandesh was annexed. However when Shah

Jahan vacated Khandesh the vacuum was filled by Bijapur and Golconda who moved into it because of the lack of a strong Mughal presence. Aurangzeb was made viceroy of the Deccan in 1636. This left the opposing states to cancel off each other's power; Bijapur and Golconda were thus poised precariously as Aurangzeb was to discover. The situation changed, when as Jadunath Sarkar, argues ⁷, there were a series of incompetent viceroys who had short terms in these areas and thus lacked any long time interest in these territories. The other group in this drama were the Nayaks, the one time feudatories of the Vijaynagar empire who were grounded in strong forts and tank based rice economies, and the Marathas very unwilling members of the Bijapur state. The transfer of power from Golconda and Bijapur, says J. F. Richards, was responsible for a decline in patronage in these areas in the period.⁸

Aurangzeb was also busy, with the Yusufzai revolt, the Afridi revolts in 1672, the Jat revolts of 1669, and the 1678 Rajput alienation. The Mughal court had become a dry one with the King himself preferring to be in the field than in the court. Shivaji had crowned himself in 1674 and he had organized the Marathas into a formidable force, even harassing

⁷ Jadunath Sarkar., *History of Aurangzeb*, 5 vols, Orient Longman 1973, vol.I-II, p.98.

⁸J. F. Richards., *Mughal Administration in Golconda*, Calrendan Press, Oxford, 1993.

the Portuguese in Goa.⁹ Most armies on the field depended on plunder to sustain themselves as the rain fed land of the Deccan would not produce much. The hinterland of the Coromandel was a rich cotton producing area. The dependence of the coastal areas on the hinterland characterized their economies.¹⁰ The gentle eastern ghats had contributed to the increased cooperation of the Coromandel with the Deccan. The other economies were more locked, especially the Malabar. The rich riverine areas had become areas of production due to the factors of transport, labor and food. Yet these arrangements were very fragile as these required constant tending, something that was lacking in the unsettled conditions of the hinterland. There was migration of people towards the European settlements and fortified towns as the records of the Fort St George show.¹¹ The moving of large armies affected this fragile economy. Francois Martin's diaries have vivid descriptions of the countryside and of the impact of the plunder the movement of the armies of the region had caused.^{12, 13}

⁹ Jesuit Records in Portuguese on Shivaji's South Indian campaign and its impact on the people'; This article contains translated letters between Shivaji and the Portuguese, *Indica*, 1986, p.89.

¹⁰ Indrani Ray , tr., 'Of trade and Traders in Seventeenth century India – An Unpublished French memoir by George Rocques', *Indian Historical Review*, 1982.

¹¹ *Diary and consultation books of the Fort St. George, 1665 –1700.*

¹² Lotika Varadarajan, *India in the 17th century, Memoirs of Francois Martin.*

¹³ Other Documents for the period are the fort St George Records, travellers, diaries and documents like the notes of George Rocques on the West Coast.

Since the troops at Gingee had not received any pay they attempted to subsist on the plunder which they secured from the territories under their control.¹⁴

This led to the migration of people in groups, who became an integral part of the economy in areas of European occupation. There was also hunger, famine and a slow down in trade in the areas of the Jesuits' operation.¹⁵

The working conditions of the Jesuits had deteriorated. The attempt at making the connection between patronage and knowledge, which they tried by their movement inwards, was next to impossible in a fluid situation like this. The Dutch were also harassing the Jesuit and his convert.¹⁶ Thus the possibility of a transfer though a change in the attitude of the Jesuit himself is impossible as the conditions above show. This means that the second possibility was not a feasible one. The immediate exercise therefore is look towards other areas for evidence if any of this 'transfer'.

It is the relationship with Sawai Jai Singh that catches attention as a first break for western science in India. Sawai Jai Singh was one of the many subsidiary Rajas under the Mughals, but his mistreatment by the Mughals led him to rebel. However he was reconciled and continued to

¹⁴ Ibid., p. 57, he also talks of the 'Bandoles' in the Mughal Army, who do not receive any pay and survived on loot. p.418, 1685.

¹⁵ *Diary and consultation books of Fort St George.*

¹⁶ *Lettres Edifiantes*, vol.X.

be part of the Mughal administration. He was educated on Modern lines. The dying out of patronage among the Mughals for the Jesuits, in whom the Mughals only found expression of a foreign religion. This had prompted the Jesuits to move away and search for new patrons. This was a major change. Among the new patrons was Sawai Jai Singh. Sawai Jai Singh was prompted to find more than just religion in the Jesuits. His interests were mathematics and astronomy. Mathematics was the Jesuits' forte and astronomy a subject of cautious study. This kept them at the Raja's court. This was however not the first instance of what we were looking for in the Jesuits, even earlier, the Jesuits had broken into the Chinese court with their astronomy and had managed to become state officials.¹⁷ This must have been an achievement considering the Chinese' staunch opposition and hostile attitudes towards westerners; as mentioned earlier and the fact that the China considered astronomy and the making of the calendar as exclusive preserves of the state and excluded the commoner from it. The position of the Jesuits in the Chinese court can thus be exclusively traced to their handling of these 'sciences'. This was similar to what the Jesuit had achieved in Sawai Jai Singh's court. Whether the Jesuit and his science did get a totally captive audience is the question that one needs to ask. What else was unique about this attempt? Was it a radically new development?

¹⁷ Needham Joseph., *Science and Civilisation in China*, Vol. III, Cambridge University press. p. 173

The character of the Raja's group who were making these observations were predominantly Indian. The interests that this particular group had were a carry off from an earlier period of the use of astronomy for astrological purposes. There were a large number of these traditional practitioners. Court records (1735) speak of at least twenty-two astronomers in Jaipur, most of them Indians. Among the most prominent of these astronomers were Jagannatha, Kevalarama, Kraparama, Harilala Mishra, Dayanat Khan, and Khairullah. The instruments of the Raja are also indicative of his interests. These instruments were all made to clarify already existing tables and verify their accuracy. The instruments of the Raja are indicative of his interest in astronomy for astrology's sake rather than astronomy itself. Out of as many as seventeen different instruments used, only the *Sasthamsa* showed any interest in anything other than astrological interest in the movement of celestial bodies. The *Sasthamsa* was a large version of the pin hole camera and was also used for studying sunspots.¹⁸

The *Zij -i- Muhammad Shahi* states the purpose of these observations and observatories:

...realizing that important affairs, both regarding religion and the administration of the empire, depend upon these, and that in the time of the rising and setting of the planets, and the seasons of the eclipse of the sun and moon, many considerable

¹⁸ See V.N.Sharma ., *Sawai Jai Singh and his Astronomy* Motilal Banarasidas, New Delh,1995, for a diagram, explanation and working of the instrument.

disagreements of , a similar nature [discrepancies between the tables and the observations], were being found...he was pleased to reply, since you who are learned in the mysteries of science and have a perfect knowledge of this matter, having assembled astronomers and geometricians of the faith of Islam, the Brahmins and the Pundits, astronomers from Europe and having prepared all the apparatus of an observatory do you so labor for the ascertaining of the question that the disagreement between the calculated times of those phenomena and the times in which they are observed to happen may be rectified.¹⁹

The purpose of the observatory was thus purely verificatory. This kind of study thus skipped the theorizing that was associated with the discovery of aberration. Importance of the 'single negative instance' was not yet understood. This meant that efforts of such a nature were primarily collecting data, an activity that is a reminder of science's early days in Europe.²⁰

Virendranath Sharma classifies the Jesuits attitudes to science into three phases; the pre-Galilean, the Galilean and post-Galilean. This he says helps characterize Jesuit reaction to Copernican theories.²¹ This however appears to be a simplification, considering what we saw in chapter II, as just the Copernican theory and its reaction cannot be looked at as constituting a rise of science. The marriage of the state and science,

¹⁹Ibid., Quotes from Hunter p.19.

²⁰ See Ante., Chapter II

²¹V.N. Sharma., Op.cit.

among the early postulates of a 'method' was finally here. But this again was only incidental with the Raja himself being part of the *Aqli Kalam*²²

Sawai Jai Singh sent an expedition to Europe in 1727, lead by Fr. Figuerado rector of the earlier mentioned college at Agra; Hosten says quoting Sommerrvogel.

Around the end of the month his Majesty gave private audience to Father Manuel de Figuerado of the society of Jesus... He turned over to the king the letters and gifts from the king of Amber, Sawai Jai Singh.....²³

But apparently the delegation never strayed out of Portugal, which by then was cleansed country with no place for anti-Catholic views, more so in the reign of the 'most faithful king' John V.

The Jesuits apparently helped with observations and answering questions. They also helped with acquiring and translating European texts. Thus Sawai Jai Singh achieved something like the project of Bacon in the *New Atlantis*. Yet this patronage for a 'science' as differentiated from the crafts is the first step towards an establishment of a scientific method in India.²⁴ The first attempts of '*knowledge of causes and secret*

²² The Four divisions mentioned in the *Ain I Akbari* in which the scientist was the last in line eligible for patronage.

²³ Hosten Collection; 'Jesuit Mission in North India and Inscriptions on their tombs', 1927.

²⁴ Science did exist but it had not made this exclusive connection with the state. The *Ain - i - Akbari* mentions they were the *Aqli Kalam*, or the fourth class of sages, a classification in which the philosophers and the religious appeared earlier as worthy of patronage of the King.

motion of things'.²⁵

The merging of science and state as seen in Jaipur is the beginning of science in India. But then it cannot be called a total transfer of Western sciences to India. The character of science in Raja Sawai Singh's court was not substantially changed, although this was the first recognizable 'House of Solomon' and the scientists at his court, India's first 'Merchants of Light'. What had changed was the 'method'.

Courts had these *scientists* earlier but not as sole searches of knowledge, there was incidental knowledge. The *Ain-i-Akbari* mentions five kinds of sages, the perceivers of the world:

His majesty who is himself the leader of the material and the ideal worlds, and the sovereign over the external and the internal, honors five classes of sages as worthy of attention... The first class, in the lustre of their star perceive the mysteries of the external and the internal, and in their understanding and the breadth of their views, fully comprehend both realms of thought, and acknowledge to have received their spiritual powers from the throne of his majesty. The second class pay less attention to the external world; but in the light of their hearts they acquire most knowledge. The third class do not step beyond the arena of observation (*Nazar*) and possess a certain knowledge of what rests on testimony. The fourth class look upon testimony as something filled with the dust of suspicion and handle nothing without proof.²⁶

²⁵ New Atlantis, Francis Bacon, in Brian Vickers, *Francis Bacon, A Critical edition of the major works*. 1996. Also see ante., Chapter II.

²⁶ Blochmann H. and Jarret, Tr., *Ain-i-Akbari of Abdul Fazal Allami*, Vol. I, p. 606.

This fourth class the, *Aqli Kalam*, is an interesting group. However, as can be seen, they were the last grade; among them was Maulana Nurdin Tarkhan, whom Blochmann locates in the *Tabqat*. The Tabaquat says was a good mathematician and astronomer. he was introduced to Babar, and was a friend of Humayun's, who like him was fond of the astrolabe. But the institution, the frame, had not arrived, or developed. In another kind of source that Irfan Habib uses, the Sufi tradition is shown as having even earlier references to the proto-scientist, (this term is not apt one, i.e., the application of the term proto-scientist, because it draws upon the west's history of the Philosopher-Natural Philosopher-Scientist development). The conversations of philosopher and the Sufi Shaikh Nizammuddin of Delhi (1325 A.D.) have instances of winning over of the Caliph from the influence of a philosopher (*filsof*).²⁷ The lack of the institution of the fourth class, and of its patronage can thus be termed as one of the characteristics of science in India.

The march of science in the west had demonstrated the dangers of it to the Jesuits' belief. The splitting up of God from his keeper was something that was best avoided, it is therefore doubtful whether the heliocentric theory of Copernicus was ever given to the court of the Raja. There was a total absence of the use of discoveries of Copernicus or of

²⁷ D.N.Jha., *Society and Ideology in India, Essays in Honour of R.S. Sharma*; 'Reason and Science in Medical India'-Irfan Habib, quoted from *Fawa-idu-l-Euad*. ed., Latif Malik, Lahore, 1966.

any reformed theories of Heaven.^{28,29} The Jesuit preferred to only correct the other observations rather than pass on the understanding and reservations that they had about the Copernican system. Thus while talking of Indian astronomy; the knowledge of the Brahmins, they wrote:

They being the Professors of Science you will perhaps be pleased to understand what notion ought to be entertained of their capacity, or rather their ignorance. It is true, I have grounds to believe that science flourished among them in former times; we still find there some footsteps of the Philosophy of Pythagoras and Democritus, and I have talked with some who speak of Atoms, according to be notion of the latter. Nevertheless it may well be affirmed that their ignorance is very great. They expound the origins of all things by means of ridiculous fables without being able to give any physical reason for the effects of Nature.

I do not perceive that they have any knowledge of Mathematicks, excepting Arithmetic, wherein they are well enough skilled but only in the practical part. They learn their art of Arithmetic from their infancy.

²⁸ V.N. Sharma, op.cit, p.302.

²⁹ Cf. Deepak Kumar., *Science and The Raj*, He mentions the opinion of Sobirov the Russian translator of the *Zij*. There is some doubt on the arrival of the Copernican system into India. Whereas V.N.Sharma states that Jai Singh's "astronomy program shows no influence of the Copernican system" (p311). Certain others on the reading of the *Zij - i - Muhammad Shahi* confirm that it was known. The question rests here and it is to be realized that this is something that goes beyond the scope of this paper, and requires substantial digging around in the archives of the Raja. However a perusal of the *Zij*'s contents seems to suggest that it was either the Tychonic system that was used or the Copernican. The Third book of the *Zij*, *The determination of the true planets and their latitudes*, calculates the distances of the planets from the Sun, something that logically speaking happens only in a non-geocentric system, possibly a Tychonic or Copernican System.

As to astronomy there is probability that it has been in use among our Indians. The Brahmans have the tables of the ancient astronomers, for calculating of eclipses and know how to make me oath them. Their prediction are exact enough even to minutes, which they seem to be ignorant of, and whereof there is no mention of minutes but only or *Garis* and half *Garis*, quarters and half quarters of *Garis*.

Tho they know the use of the aforesaid tables, and foretell the eclipses, it is not to be imagined that they are very skillful in that science, all their skill is mechanical and performed by some arithmetical Calculations. They are altogether ignorant of the theory and have no knowledge of the connections those things have among themselves.

Having but a false system of Heavens and the stars they tell the greatest extravagances of the motions of the sun and other planets. For instance, they believe that the moon is above the sun, and when we go about to demonstrate the contrary to them, by reasons deduced from the eclipse of that luminary, they grow into a passion, only because their principles are contradicted. They further believe, that when the sun has enlightened our hemisphere, he hides himself, during the night behind a mountain. They reckon nine planets, supposing that the sign of Pisces rising and setting makes two real planets; and therefore call them *Ragou* and *Kedou*. Nor can they be persuaded that the Earth is round, but they assign it an extravagant figure.³⁰

The above passage shows the Jesuits' selective approach to the topic cutting out all but the necessary part of the debate of the Indian

³⁰ *Travels of several learned missionaries into divers parts of the Archipelago*, Letter from Fr. De la Lane; Mission S.J. To F. Mourgues, Jan 30, 1703. This is an Early letter, for the purposes of the study, but is a good indicator of their attitude.

systems and sticking to the non-mentioning of Copernican ideas, even while they are using it to make their calculations in Europe and were taking active part in institutions which acknowledge Copernicus, Kepler and Galileo as in the Royal society of England.³¹ This indicates the third possibility, the situation whereby science could have been transferred through a demand. The result, as we just saw, was that the Jesuit had achieved the same equation with power as they did in China due to their knowledge. But as we shall see later this was not so in the sub-continent. All that had happened was the first of the Bacon's ideas, the establishment of a connection between state and science. The change was an indigenous one, the Jesuits merely gave it a direction by incorporating into it the aspects of Bacon that they liked and becoming the first of the 'merchants of Light'. This asks the question of whether the Jesuits were involved in institution building. The university, or educational institution, is what we are looking for as said earlier, this was the institution that gave early science a debating platform, and it did make an appearance in India in the early stages of the Jesuits' activity in India.

Among the many institutions, and institutions are important part of science too, were universities in Europe. Most universities had Christian antecedents. The Jesuits in the sixteenth century had assumed the role of school masters of Europe after Ignatius understood the

³¹ Joseph F. MacDonnel, S.J., *Jesuit Family Album Sketches of Chivalry from the early Society Clavius Group*, Easter 97.

advantages of trying to spread the ideology of Christianity through these institutions³². However the universities were also common ground for science and debates.

Jesuit efforts in India started off with the establishment of a college in Goa; the St. Paul's. It was from this college that they spread out from and taught new recruits. The college was an object of attention not only from the order but from the Portuguese authorities too. The active role of the Portuguese in the establishment of this college was commended by Francis Xavier, who otherwise had great reservations about Portuguese attitude and works. The college had wealthy sponsors along with patronage from the Portuguese governor. Comparison of the colleges' structures were made with the college at Sorbonne. The college could support a 100 students even at the beginning³³.

The colleges of the order had been open to general students almost from the beginning. They were taught along with the others receiving a religious education. These students, known as the *externs*, were taught what was in vogue in Europe - the classics and languages; along with natural philosophy. They were taught the Aristotelian works from what can be gathered from Descartes's references to his schooling at La Fleche

³² The *Ratio studiorum* was the result of Ignatius's experiences of being confused in the earlier system of education. The *Ratio Studiorum* was what dictated teaching practices in Jesuit schools. It was published in 1599.

³³ *Letters and Instructions of Francis Xavier*-translated and introduced by M. Joseph Costelloe., S.J., Gujarat Sahitya Prakash, 1993.

under the Jesuits. At La Fleche, Descartes mentions, Coimbra, Toletus and Rubius as his teachers; books written by them were prescribed at St. Pauls in Goa too. The Coimbra had written a work on Aristotle, Toletus wrote, commentaries on Aristotelian logic, physics, and his *De Anima*. Rubius wrote *Logica Mexicana*, physics, *De Caelo* and *De Anima*. The college at Goa was also started in the same image.³⁴ An elementary school formed the lower section of the college, the next stage was high school and finally the college. The high school had three classes of language where Cicero, Virgil and Ovid were taught, as also the gospel. Then they were put to a three years philosophy course; the philosophy taught was Aristotelian.

At the end of the Philosophy course a thesis had to be written by the student and publicly defended.³⁵ The early printing press at Goa had published conclusions from some of these theses. In spite of the efforts parity with Europe could not be achieved. There was a shortage of trained men, which could not easily be tackled frequently we come across requests for 'men of virtue' rather than 'men of learning':

Many fail to become Christian in these regions (Cochin) because they have no one who is concerned with such pious and holy matters. Many times I am seized with the thought of going to schools in your lands and of crying out there, like a man who

³⁴ Anthony Kenny tr., ed., *Descartes' Philosophical letters* Blackwell Basil, 1981.

³⁵ C. Marattukalam, 'Jesuit Colleges and Jesuit Scholars in the old Society of India in Jesuit Education in India', *Catholic education in India*. Gujarat Sahitya Prakash, 1987.

has lost his mind, and especially at the University of Paris, telling those in Sorbonne who have a greater regard for learning than desire to produce fruit with it... I fear that many who study in the universities study more obtain honors, benefices or bishoprics with their learning than with the desire of adapting themselves to the demands of these honors and ecclesiastical states. Those who study are accustomed to say: "I wish to become learned so that I can obtain a benefice or ecclesiastical honor and then serve God with such honor."³⁶

The 'fruit' here are conversions. Since this was dull drudgery, as Xavier himself says on occasion, there was a marked tilt towards producing only the men of virtue. The motives of the college are most clearly expressed in the passage below. Nicolo Lancilloto writing in 1546 says:

I cannot expressing writing how great a need there is here men who are both good and learned, especially since the main purpose of our order is to teach Christian doctrine. Since there are very few who wish dedicate themselves to this, and the land is extremely harsh and difficult for us who have been born in Europe and are unable to endeavor the require labors in these region because of the climate; I think that it would be most wise and useful to establish houses or colleges in this houses or collèges in this land in which people of this country would be taught all the sciences, since they are more suited for bearing the heat of this land which is almost intolerable... And since young men who would be willing to leave everything to dedicate themselves to religion are not to be found, young boys must be taken in and taught letters and holiness of life until they have

³⁶ Costelloe, *Op.cit*, Letter of Francis Xavier from Cochin, Jan 15, 1544, To companions in Rome, p.63.

attained a mature age and can thus choose good and evil for themselves.³⁷

However India was only their second choice. The Jesuits could not adjust with the overall indian environment. They equivocally preferred the Japanese. That Japan had a lot of importance for the Jesuit is clear from a perusal of the province funds for the years 1585-88. Province fund was set at 4% of the total annual revenues for that province. The first interest shown in Japan as a 'stage' was by Xavier. This was in 1549. In 1581 it was created as a part of the Goa assistancy. What is therefore surprising is that province fund figures for the year 1585-1588, for Goa and Japan were identical. This shows that the Japanese arm of the Jesuit was stressed upon. Apart from this fact it also needs to be understood that the area and the number of people financed by such large revenues is very different. The number of people serviced in Japan was very few. It is important to note here that in comparison to India, In the Case of Japan the Jesuits had greater freedom in their 'independent' trade. This increased the volume of money available with the Jesuits for their Japanese work, considerably.³⁸ The Jesuits are said to have taken part in the trade from Malacca to and from Japan. Japan was therefore definitely being looked after better than the Indian provinces of the Jesuits. This might have also been due to the lack of interference by the Portuguese.

³⁷ Ibid., Letter from Goa, 5 Nov, 1546; from Nicolo Lancilloto to Loyola, p.160.

³⁸ See Charles J. Borges., *The economics of the Goa Jesuits, an explanation of their Rise and fall 1542-1759*, concept pub. 1994, p. 117.

The following extract very clearly highlights the fact that the Jesuit did adopt a conscious policy with regard to the 'groups' in India:

.... those who built this college decreed among other things that no one should be received into it who had not been born of an Indian father and mother; they did not wish that the sons of Portuguese from Indian mothers should be accepted; and not without reason. They say of the Portuguese: "If we accept Portuguese with these blacks, there will always be contention since they will say: 'you are black and I am white, you are a captive and I am free' "and so forth. Mixed bloods in this land, moreover, do not have a good reputation; there is thus no one who expects anything good from them.³⁹

Each group the Jesuit met was characterized, the Indian, the Brahmin, the 'Mixed bloods', the Japanese as men of reason, and the Chinese as the source of Japanese intelligence. This is besides the division of Black and White, the Chinese and the Japanese being white,⁴⁰ as were the Portuguese.

This above characterization was in full view in St. Pauls college in Goa where Japanese and Chinese pupils were also enrolled:

Strive earnestly to teach and instruct and Chinese and Japanese boys in this college in preference to all others, taking great care that they advance in spirit and learn how to read, write and

³⁹ Costelloe, Op.cit., p.166.

⁴⁰ It is not entirely clear as to what this division between white and black meant. We must be careful not to read too much into this division. However it can be seen as a way of expressing 'similarity' a characteristic of the Jesuit. Also see *Infra.*, Conclusion.

speaking Portuguese so that they may act as interpreters for the priests who, if it pleases God our Lord, will within a few years go to Japan and China, since it seems to me that in no other regions that have been discovered can so much fruit be gained as in there, or that the society will be perpetuated by itself anywhere except in China and Japan; and this is why I am so highly recommending the Chinese and the Japanese to you⁴¹

As in the passage above; the Japanese and Chinese were treated with extreme care, as opposed to the Indian who was required only to popularise Christianity and induce conversions - 'fruit'. In other words, unlike the expectation of the Japanese who would make it easier to debate and thus plant the seed of Christianity. The gathering of this fruit in India required only 'men of virtue' and thus the teaching at Goa was bound to be influenced and started towards this purpose. It is thus very doubtful whether 'the sciences' were taught to the 'men of virtue'.⁴²

Added to this was the shortage of men. This was a general shortage faced by the order in all parts of India and not just in St. Paul's alone. The records for the year 1585-88 show a total of 80 Jesuits and 50 servants working at St. Paul's. These men were paid from the incomes of properties attached to the institution. These incomes were then divided among the Jesuits themselves and smaller institutions like the attached Churches. In 1585-1588 out of a total of 34,38,060 Rupees, a large chunk,

⁴¹ Costelloe Op.cit., Letter from Francis Xavier To Fr. Paulo in Goa, Kagoshima Nov 5, 1549, p. 314.

⁴² See Ante., p. 82.

13,98,000 Rupees(41% approximately) was given to the men. This was a large amount of money for the small group considering that the Churches of Bandra , Kurla, Serra, and Choraó along with medicines for the Hospital and charity accounted for the rest. This made for a balance of 1,20,060 Rupees each at the rate of 10,754 Rupees per man (approx.) over the three years. This could only support another 11 men at most. Considering that the European Jesuit was paid more, the number of people that could be supported would have been lesser than the 11 possible. Other factors like the fact that the men were supposed to move out of Goa and preach along the coasts would have brought down the number of men capable of teaching at the College.⁴³ Moreover the Indian was not thought to be fit for the job of teaching. The only ordained Indian being a Brahmin from Kerala, Peter Luis. After 1560 even this avenue was closed⁴⁴. Xavier's letters also point to the shortage:

Above all, dearest brothers, I ask you for the love of God to send every year many of our society, since they are lacking here....⁴⁵

This shortage was also because of the Jesuits association with the Portuguese state. The *Estado* had problems with nationalities other than Portuguese.

⁴³ Cf. Charles D Borges, *The Economics of the Goa Jesuits* appendix 7 for the Income and Expenses of the St. Paul's. Concept Publishing, New Delhi 1994.

⁴⁴ Afonso Coriea., *The Jesuits in India 1542-1773* Gujrat Sahitya Parishad 1997 p.68 quotes from Wicki . J ., *Documenta Indica*.,Vol. XIV

⁴⁵ Costelloe, *Op.cit*, Xavier to Companions in Europe. Malacca, Nov 10, 1545.

The college moreover was under the Portuguese and it was handed over to the Jesuits by Cosme Anes, one of the many founders of the college. This could have also been an impediment. However this requires further investigation. What is known however is the fact this was given its revenues by the Portuguese.⁴⁶

This combined with the attitude that among the 'pagans' there was no need for learning, did hamper any attempts if made at exchanging knowledge. But the biggest single factor must be the lack of men; that so many of the letters mention. Education, and the early exchange of ideas of the west, especially of their 'Experience' almost excluded the emergent ideas of science. This did leave out other areas as for example the Mughal mission, but even this as was seen earlier was not a feasibility, as in the swinging fortunes of the college at Agra and Lahore, an atmosphere for the introduction of the idea is almost non-existent.

By the end of the seventeenth century the Jesuit who came to India had a different character. A perusal of the letters themselves indicates the difference. There are detailed observations of geography, botany, medicine and medicinal practice, astronomy and its tables and more comparisons of Indian science and other branches of knowledge. More interestingly, Jesuit knowledge was used on the ground among the neophytes. Medicine was the best example, saving a man's life had

⁴⁶ Ibid., Letter from Cochin, Feb 2, 1549, to Simao Rodrigues.

advantages the Jesuit discovered and wrote back home about it.⁴⁷

Astronomy and its relation to God, had made it one of the principal subjects for the change in which science moved upwards and thus became more important than religion. The debate on God had evolved out of this subject. The insights that were gained from this were later on applied to subjects other than astronomy. In fact the early attempts at this applied this philosophy to almost everything. Magic, witchcraft, alchemy, and science was a strange mixture. But, the common thread was application of the method to it. Early science in Europe was thus a mixture of what we today perceive as opposites.

Other parts of the sciences that we now know as botany, geography, medicine had even before been the realm of specialists and there was some classification and understanding of its principles. Thus botany was at the same time classifications of plants and the search for monstrous variations. The unfettered imagination had added to it all manner of species. Geography and seen attempts at map making; and medicine evolved to treat. But the one common thread that runs through this developments of extracting science from magic and religion was the new found freedom to explore; debates with the Church of Philosophers

⁴⁷ The Jesuit had established Hospitals even before; but they were institutions that specialized, and were more of fixed institutions than a knowledge that could be transmitted. There was a hospital at Goa, that Xavier on arrival worked in; meant for the lepers as also general members of the Portuguese town. The relation of Gurrereo also have examples of the use of medicine in the Mughal court among the nobles.

had managed to make the distinction between the Book of God, and the Book of God's works; the Bible and Nature. Consequently, there was the rise of the method, giving these new explorations a guide akin to morality for religion.

These were sciences that required patronage, the scope of its being usually beyond the individual, travelling and collecting data was something that required regular organisation. The result was that patronage was essential for this effort. The rise of geography is only as a response to the need of the travellers in many parts of the world. This was a predominantly European enterprise, the charting and mapping of the world. The Jesuit, as we saw in Chapter II, were the merchants of light in this enterprise. This was effort that could be carried on quite early in India, and does not come within the ambit of the question of whether it was transferred. The simple reason being the fact that there was no need to. The demand on the Jesuits in India was usually for things that aroused curiosity or otherwise dependent on the interests of their native patron. The Jesuit only transferred what there was a demand for.

Among the first Jesuit geographers in India was Father Monserrate (1536-1600) who made observations on the way to the Mughal mission, and even while travelling with Akbar. But the tradition was only serving the purposes of Europe's curiosity and Father Monserrate books remained unused at the Mughal Court. The other geographers were

Boudier, and John Baptist Pons, both sent in observations from India for European map makers for their use. Fr. Bouchet, Fr. Stephen and Fr. Noel in South India sent regular reports. Benedict Goes' travels also provide geographical data. However, most notable of these efforts was by Fr. Joseph Tieffenthaler (1710-1785), his contributions to European curiosity were many. He also drew among the first accurate maps of the Ganges. These attempts kept them in favor with Europe's curious elite, to whom the Jesuits usually appealed for patronage.⁴⁸

In India on the other hand, the demand was of a different sort. It was for curia. In the court of Jahangir for example it was the European paintings that sparked interest.⁴⁹

The effort was to impress and gain favour rather than the motive to spread science for its own sake. Among the most demonstrative was of this aspect is the use of mechanical objects as means of avoiding the punishment. Fr. Bouchet for example made a machine for the *Talavai*⁵⁰ or the over lord in exchange for the freedom to practice his Christianity and convert.⁵¹

⁴⁸ See., The 'Observations' in the *Lettres Edifiantes* Vol. XV p.337 for detailed tables on latitude and longitude and distance made by a Jesuit missionary travelling from Delhi to Jaipur.

⁴⁹ C.H. Payne, Tr., *Jahangir and the Jesuits: with an account of the travels of Banedict Goes the Mission to Pegu*. From the Relations of Father Fernao Guerreiro, S.J, p.77.

⁵⁰ *Lettres Edifiantes.*, Vol X Fr. Martin To Fr. De Villette, April 1701, p.80

⁵¹ See, A.J.Qaiser., for the response to such kind of 'transfers' in *Indian Response to European Technology and Culture 1498-1707* OUP Delhi 1996,

Medicine was the most effective and the Jesuits were extremely interested in local medical practices. Remedies and cures for different ailments were studied and dispensed.⁵² The result usually the gained favour among the locals. Even the Jesuits learnt about there remedies and wrote home about them. Most of these treatments were for fevers and pains. The only instance of a treatment being offered to a noble man is when a courtier's son was treated by the Jesuits, and the king thanked them for it in the Mughal court.⁵³

However any connection or sustained relationship with the Jesuits on the basis of knowledge is not seen. This was, as mentioned earlier, because of the link between state and science not being made. There was not even a possibility therefore that this could have led to a steady interest in this knowledge and then improvement.

Later missionaries were expected to observe scientifically and were given explicit instructions for the same; as can be seen in this letter from Fr. de Bourzes:

Reverend Father

Just as I was upon the point of Embarking for India, I received a letter from you, where in you advised me to devote some moments to the sciences; as far as the employment of a missioner would permit, and at the same time to acquaint you

⁵² Rabies was one of the many ailments that sparked interest, see., *Lettres Edifiantes* Vol. XI, p.156

⁵³ *Ibid.*, p.88.

with what discoveries I should happen to make. I thought of complying with you, even during my voyage; but I wanted Instruments and you know they are absolutely necessary when anything is performed with exactness.⁵⁴

None of the earlier letters show such clarity with respect to the understanding of the subject, the 'need for exactness'. Elaborate tables of observations especially astronomical were sent to Europe.⁵⁵ This was also because of the Jesuits' changed position in Europe, where they were now associated to considerably with the societies of science.⁵⁶

The audience of these letters had also changed as a result of the many changes described in the earlier chapter. This audience had also to be kept in view. Also, since the decline of the Portuguese, funds also came in from this audience; as Kate Teltscher explains in her Book.⁵⁷ It can also be understood from the following letter:

Some leading figures who in this city (Rome) read with much edification for themselves the letters from India, are wont to desire, and they request me repeatedly, that something should be written regarding the cosmography of those regions where ours (i.e., the members of the society of Jesus) live. They want to know for instance, how long are the days of summer and of winter,

⁵⁴ *Travels of several learned Jesuit missionaries of the society of Jesus into Divers parts of the Archipelago*, p.191.

⁵⁵ *Lettres Edifiantes*, Opcit, Vol. XIV, has tables on astronomy, latitude, longitude and the positions of stars including diagrams of fossils and Botanical drawings.

⁵⁶ The Introduction to the *Lettres Edifiantes* are the purposes of the letters.

⁵⁷ Kate Teltscher; *India Inscribed: European and British writing on India 1600-1800*, Oxford University Press, 1995.

when summer begins, whether shadows move towards the left towards the right. Finally, if there are other things that many seem extraordinary. Let them be noted, for instance, details about animals and plants that either are not known at all or not of such size, etc. And this new sauce for the taste of a certain curiosity that is not evil and is wont to be found among men may come in the same letters or in other letters separately.⁵⁸

The role of the Jesuits had changed both in Europe and in India. The Jesuit was a source for science in both areas; contributing in Europe and cautiously dispensing in India. This allowance of a search for the 'physical reason for the effects of nature'⁵⁹ was the concession they allowed and may be the few acknowledged changes towards 'the first cause' of things among this group.⁶⁰

To conclude, the chances of a western science coming through the Jesuits did exist throughout the sixteenth and the seventeenth centuries. but as seen, conditions in India were not considered encouraging by the Jesuit to make the move of parting with knowledge. This, as we have seen, was also due to the general impression the Jesuits had of India or at least the image they had of India when compared to the Chinese and the Japanese.

The strongest power of the day, the Mughals were also not an answer for the lack of patronage because of its involvement in the

⁵⁸ Quoted from Afonso Corriea ., *Jesuit letters and Indian History 1542- 1773* Bombay, 1969, p.14.

⁵⁹ See Ante, Chapter II.

⁶⁰ Brian Vickers, (ed.), *Francis Bacon A critical edition the major works*, 'The advancement of learning' Oxford University Press, 1996. p122-123.

Deccan. The first window of opportunity was the court of Sawai Jai Singh; he was interested in the knowledge the Jesuit held rather than just the religion. This encounter was just right for both science and India. The Jesuit and his science had found patronage. India had found science in the arrival of the method however it must be stated here that the colour of this effort was predominantly Indian.

Conclusion

Science had been changing its position with respect to religion throughout the sixteenth and seventeenth centuries. Ascribing it a character and studying it as a body of knowledge, over this period is extremely difficult. The construction of science, and its claim on the intellectual sphere of the day is thus gradual; even talking of it as 'Science' would not be appropriate. That science's surrounding media is acting differently from its usual, is sometimes the only indicator of a change; and this was the case in the sixteenth and seventeenth centuries. But what was most astonishing about this change was the way it was built. The calm was superficial, and science was just one of the many things in this medium. The building up of its instruments, the methods of its attack, the gradual slow peeling off of religion from the keepers of the religion had given it momentum, to rush clear to the surface. The ways in which this was machined has already been looked at in chapter two. What was left floating were bits of the anchor that had once grounded the earlier structure.

Science was thus characterized by its capacity to change. The Jesuit, earlier one of the anchors, was by the end of the period afloat, groping for new realities, in a new world. The only aids they discovered is the new structure itself. The Jesuits were learning to use that too. Their new role had reassembled their identity. It was not long before the new structure gained

consciousness. Rationality had come of age and the tool questioned the user. Attitudes toward the Jesuits had also changed as is seen in the writings of Voltaire, making him remark "O monks, monks be modest, as I have already advised you, be moderate if you wish to avoid the calamities impending over you"¹. Ironic in a way because Voltaire was himself a Jesuit product. Voltaire was the final stopper in the now bottled genie of religion. This genie was the opposite of his vision of rationality and a symbol of diversity and of error. Science had now begun to talk of itself and what it was not - consciousness.

Uniformitarianism of truth being recognized as truth whenever put before us was the result of shaking up of the earlier medium.²

This has meant problems. Problems of not being able to put it in definite terms, the change that we speak of. The carrier himself was changing, something that makes it impossible to really understand what the missionary in the context of science in India *really* means. The missionary cannot be taken as fixed for the study, and neither can India. The only other option was to define the science and give it a character, to understand it before it was given to the Jesuits, the changes the Jesuit had undergone because of it; then to understand the conditions of its operation, and of the changes that can it can be expected to have, filtered as it was through the Jesuits.

¹ E. True Love, (ed.) ,Voltaire, *Philosophical Dictionary*, p.82.

² See Kart Popper., *Conjectures and Refutations*; New York, 1963.

The Jesuits were part of the earlier medium in which science emerged and hence the possibility that it might have been introduced into India earlier than we thought needs further exploration. Whether this was a possibility is thus investigated, necessarily within an Indian setting and an understanding is sought. The fact that it was not so is seen, and thus we had to search for that vital transfer if there was one.

There were other influences on science, the rise of trading empires is one. That every such system has its specialists, as in the case of Garcia d'Orta,³ a physician who sent home detailed studies of plants and their properties. But then these are single instances of science, of little meaning. For the knowledge that India possessed was in the end not changed.

The development of the method, the right motions of discovering truth was one of the major pillars of the new structure, we understand, had a lot of adaptation. Each of the phases was thus characterized by its method, its way of asking questions and of knowing where to stop. The arrival of the method through Bacon and Descartes and its revising in society was one of its biggest breaks and the first sign of alternative institution of rationality.

This rationality had to essentially market itself through patronage, as Bernal locates the growth of the idea in the patronage of the merchant through to the state. This amalgamation of state and science was its final

³ A.d'Costa., Garcia de Orta, as a source of Indian History' by *Indica*, 1970.

version in the period of our study, both in Europe and in India.

The Jesuits' search for similarity is making of an early image of the orient. This was an outcome of both conditions in Europe and India. Interestingly this helped them survive in both areas. The image of the Indian and India in the minds of the Jesuits rested on the opinion that India had 'fallen'. This attitude is prevalent among the later letters. The search for a similarity was a result of their adoption of the new rationality. This rationality decreed all variation as marks of untruth, a position which the Jesuit wanted to avoid. Indian idolatry was thus a "corruption of the Scripture" and Indian science had drawn off the Philosophers Pythagoras and Democritus. The image of India was of dulled lustre therefore, and the use of science was as the Jesuits said:

To that purpose [of demonstrating the reasonableness of Christianity] we then improve ourselves in those sciences, which are known, among the Idolaters, in whose conversion we are labouring; and we make our business to discover even among their errors, something that may convince than to the truth we come to make known to them.⁴

⁴ Letter from Carnate from Bouchet to Bishop of Auranches in *Travels of several learned missionaries of the society of Jesus into divers parts of the archipelago, India China and America*. London 1714.

This task of finding the truth among the errors is the use of this rationality as also the indicator of his mindset.

India as projected by the Jesuit in the west was the 'similar'. The Jesuit projected himself to the neophyte as similar to him. The giving up of the Portuguese identity, the association with local traditions, and the Nobilean use of syncretism were only to make the Jesuits more similar to the convert.

The similarity of the converts to the Jesuits had earlier been because of their 'degraded Christian' status. The knowledge of the working of St. Thomas and their meeting with the Syrian Christian enforcing this view. The others were 'Pagan'. Later developments of science had made the Jesuits locate similarity in those 'Pagans' and the search for marks for 'truth' among them. The Jesuits position in India had been changed thus, by developments in Europe.

Even observation of nature had changed. Earlier observation had studied astronomy but not necessarily for astronomy's state. As can be seen in the passage below, the purposes were different, a reflection of the period on science. As early as 1566, Jesuit observers in Goa had studied a lunar eclipse. Given below is the extract of it sent to Europe:

The eclipse of the moon which was observed in Goa on 28 October, in the year of the lord 1566, lasted three and half hours. It commenced at six minutes to seven, and the moon stood fully clear at six minutes to half past ten: that is to say, the mean duration of the eclipse was one hour and forty five minutes here in Goa exactly at thirty-nine minutes past eight.

The letter is observation until this point. The nature of the observation is characteristic:

Our Almanac which was prepared in Bologna, calculated that the eclipse would be at its height at one minute past four in the afternoon, while here it was at thirty nine minutes past eight. which means that the difference between this place and Bologna is four hours and thirty-eight minutes. It follows that the difference between Goa and Lisbon is five hours and thirty nine minutes.

This eclipse was observed by Father Francisco Rodriguez who at daybreak had clock accurately set in order that, when the eclipse commenced it might not fail to mark the exact time. He also did these calculations; which I have noted down here for your reverence. That will enable you to gauge the distance from Goa to Lisbon.⁵

The effort is thus to measure the distance; not to say anything about the planets, this must be contrasted with the observation on the Indian observations of eclipses quoted in Chapter III, where eclipses mean more than just a calculation are indication of the structure of the heavens'.

The character of the knowledge is thus seen influenced by the changes in Europe and changing demands in India. The fact that something had changed must be looked at as due the Introduction of the Method than anything else; even this was not satisfactory. For the Jesuits these institutions were the true 'Houses of Solomon' the one they had helped build. These houses of Solomon had been grafted as to an existing group of proto-

⁵ First recorded Lunar eclipse in 16th century Goa *Indica* 1984.

scientists (to use the word again). This was trying at raising the early structure in which the Jesuits were comfortable. The hazy and nebulous idea of an institution was developing a notable ruler himself was the member of the *Aqli Kalam*, which was not an insignificant development. This could be seen as the ascendancy of the 'fourth class'. Patronage and science had come much closer and the Jesuit had given it direction. The *Aqli Kalam* had arrived at the House of Solomon.

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“I dont know”

- Voltaire.