WHY DIDN'T THE SCIENTIFIC REVOLUTION HAPPEN IN ISLAM?

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Every great civilization writes its own history, selectively extracts data from the past, and then proves to its satisfaction that its greatness has no peer or rival. The dominant civilization of our times, the West, has also defined a vision of cultural and intellectual history wherein the development of science is presented as the unilinear and inexorable march of Greco-Roman ideas into the European Renaissance period. It is only over the last few decades that there has been some widening of perspective, and beginnings of a realization that the roots of science are to be found in highly diverse cultural and temporal origins. Principally because of the work of historians of science like Sarton and Needham, the role of other major civilizations – particularly the Islamic, Chinese, and Hindu – can no longer be peremptorily dismissed as before.

Given the fact that, at the peak of their glory, all the major civilizations had made creditable advances in human knowledge, it becomes a viable hypothesis that any one of them could have fathered the Scientific Revolution. But the historical fact is that it was in the West where modern science began. Why the West?

For sociologists like Weber – whose work profoundly influenced Western perspectives on Oriental civilizations – the reason is to be found in the superiority of the collective European mind. Weber had gone so far as to suggest that Europeans are genetically endowed with comparatively greater amounts of rationality, thereby allowing for the speedier development of a rational capitalist ethic. Such racialist arguments are not worthy of serious discussion; for one, the rapid growth of scientific culture in many non-European countries today provides an obvious refutation of the claim that the European mind has a monopoly on scientific thought. But there are still many questions left to answer and debate.

In particular, why did the Scientific Revolution not take place within Islamic civilization between, say, the 9th and the 13th centuries? This question is not absurd. A Martian visiting planet Earth in 1100 AD would have concluded that the Arabs were by far the most advanced civilization. Five centuries of Islamic scientific and intellectual leadership could have, but did not, lead to the emergence of a modern, universal system or modern science. Obviously, the explanations one puts forth must necessarily be speculative. There is no laboratory in which to observe how the germs of scientific progress, when injected into different social environments, respond to different nutrients and conditions. But even if the internal complexity of human society and the diverse nature of external influences upon it preclude the isolation of a single factor, the arguments and partial attempts at explanation can be interesting, rewarding, and perhaps important.

This brings before us matters whose domains range from philosophy and law, to economics and politics. Hard though these questions may be, they are not irrelevant; some of the forces which had retarded scientific development in Muslim societies in the past are operative today as well. In seeking to answer the question which forms the title of this chapter, it appears fruitful to consider five distinct sets of causes:

- Those related to matters of attitudes and philosophy.
- Those deriving from a certain concept of education.
- Those which are the consequence of the particular nature of Islamic law.
- Those which can be traced to the non-existence, or weakness, of certain socio-economic formations such as autonomous cities and trade guilds.

• Those deriving from the particular character of politics in Islam.

It can be argued that these causes are not elemental; each does influence the other. For example, attitudes and philosophies are shaped by the level of sophistication of productive forces in a society – it is an obvious fact that people living in cities think and behave very differently from those in villages. But the reverse is also true: the successful assimilation of new productive forces into the economic structure of society does demand certain attitudinal requirements as a prerequisite. Similarly, education necessarily reflects existing beliefs, but can also be a vehicle of change. So, rather than engage in an extensive debate over which is the cause and which the effect, we shall be satisfied by identifying what appear to be plausible and logical explanations.

1. Attitudinal – Philosophic Reasons

The acquisition of positive, rational knowledge – or, what is more or less the same thing, the pursuit of science – is determined to a great degree by the overall idea system which prevails at a given time in society. Overall idea systems – by which shall be meant beliefs, attitudes, social mores, general assumptions, and specific religious and ideological positions – are of the most profound importance in human history. Julian Huxley compared them to skeletons in biological evolution: they provide the framework for the life that animates and clothes them, and in large measure determines the way it shall be lived.

The notion of rationality – which is so crucial to science – exists within every idea system although the importance assigned to it may vary. What does rationality mean? The 19th century philosopher, Nietzsche, gave a succinct definition: rationality is a matrix of connections which assigns cause to effect. Looking for the roots of rationality, Nietzsche delved deeply into the psycho-biological roots of epistemology. He argued that rationality is an inescapable consequence of what he calls man's "will to power". Buried in the human psyche, he argued, is a deeply seated – and possibly inexplicable – urge to have control over the events of the outer world. This "will to power" is the psychological mainspring of all creative activity. Rationality is essential for sublimation of this urge because without it there can be no chance for any biological species to even understand, much less control, its environment. Stripped of the "will to power", humans become mere buoys that float on the waves. Armed with this bit of philosophy, we can proceed to ask the question: what impels one society to nurture science to a degree which is greater or lesser than in another society?

If science is viewed as a consequence of man's "will to power", then the answer is to be found in those societies, like individuals, differ greatly in the extent to which they possess this inherent drive. One expects that the search for causal connections – rationality – will become less intense once it is admitted that God's will forms part of the matrix of connections. That is, the greater Divine intervention is in the affairs of the outside world and the smaller the influence of mortal will on the Divine will, the less scope there is for any exercise of the "will to power". If Divine intervention is complete, then curiosity, imagination, and ambition become superfluous. A society oriented towards fatalism, or one in which an interventionist Deity forms part

of the matrix of causal connection is bound to produce less individuals inclined to probe the unknown with the tools of science.

In the heyday of its intellectual and scientific development, Islamic society was not a fatalistic society. The fierce debates between those believing in freewill (Qadarites) against the pre-destinarians (Jabrias) were generally resolved in favor of the former. But the gradual hegemony of fatalistic Asharite doctrines mortally weakened the "will to power" of Islamic society and led to a withering away of its scientific spirit. Asharite dogma insisted on the denial of any connection between cause and effect - and therefore repudiated rational thought. It also rejected "secondary causality", the notion that God is ultimately responsible for everything but only through the laws he has made for the world. The anti-science nature of the Asharites is evident from their belief that any kind of prediction is impossible. Even a speeding arrow may or may not reach its destination, they said, because at each moment along its path God destroys the world and then creates it afresh at the next moment. Where the arrow will be at the next moment, given that it was at a particular spot at an earlier moment, cannot be predicted because it is God alone who knows how the world is to be recreated.

We have also encountered the views of Al-Ghazali who was the most influential of the Asharites – in fervently denying the existence of causal connections, he went so far as to say that a piece of cotton does not burn merely because fire was put to it but, instead, because God intervenes either directly or through his angels. Al-Ghazali ends one of his arguments on the subject, saying:

> *"And this refutes the claim of those who profess that fire is the agent of burning, bread the agent of satiety, medicine the agent of health, and so on." [1]*

The eventual preponderance of such fatalistic attitudes, the denial of independent judgment, and rejection of the Greek rationalizing culture, made it harder for any important intellectual advance to occur, much less allow for a Scientific Revolution.

A second factor which discouraged learning for learning's sake was the increasingly utilitarian character of post Golden-Age Islamic society. Utilitarianism – the notion that the only desirable things are those which are useful – was not an obsession of Islamic society in the early days of its intellectual development. When, for example, Caliph al-Ma'mun created the Bait-ul-Hikmah in Baghdad and sent emissaries far and wide to seek manuscripts on matters of learning and science, the basic motive was altruistic rather than materialistic. Indeed, the possibility of material reward in the form of improved or new technology was virtually non-existent because the relation of ancient science to ancient technology was far from the one it is today. Although there are exceptions to which one may point - like alchemy and medicine - knowledge was not principally valued for utilitarian ends. But eventually the notion that the only useful knowledge is practical knowledge, and the inevitable denigration of theoretical knowledge, permeated throughout Islamic society. This was coincident with growing rigidity of dogma and closing of the doors of theological inquiry.

We can witness the lack of interest in "useless" theoretical knowledge among Muslims beginning around the 14th century, and continuing well into our times. Even Ibn Khaldun, the most celebrated thinker of the Muslim Middle Ages, showed only mild curiosity about goings-on elsewhere in the world:

> *"We learn by report that in the lands of the Franks on the north shores of the sea, philosophical sciences are much in demand, their principles are being revived, the circles for teaching them are numerous, and the number of students seeking to learn them is increasing." [2]*

But Ibn Khaldun did not see this as an alarming development or an occasion for trying to emulate the Franks. On the contrary, he remained bitterly opposed to the study of philosophy as well as alchemy. His attitudes reflect the mood of his time, which had lost the spirit of free inquiry.

The same lack of curiosity was shown by subsequent generations of Muslims. We see this in the attitude of the Turkish Ottomans who, in the sixteenth century, had established an extensive and magnificent empire. Ottoman rulers did recognize the utility of some recent technological inventions of the West and they even appropriated some of these. But they were not inclined to allow advances in thought or to recognize that technology was a consequence of scientific thinking. This was observed, for example, by Ghiselin de Busbecq, ambassador of the Holy Roman Empire in Istanbul, in a letter dated 1560 in which he wrote that:

> *"no nation has shown less reluctance to adopt the useful invention of others; for example, they have appropriated to their own use large and small cannons and many other of our discoveries. They have, however, never been able to bring themselves to print books and set up public clocks. They hold that their scriptures, that is, their sacred books, would no longer be scriptures if they were printed; and if they established public clocks, they think that the authority of their muezzins and their ancient rites would suffer diminution." [3]*

The general lack of interest among Ottoman Muslims in recently discovered wonders of science is also reflected in an embassy report by Mustafa Hatti Efendi, who went on a mission to Vienna in 1748. While he was there, the Turkish entourage was invited by the Emperor to visit an observatory where various strange devices and objects were kept. Efendi and his group were not impressed:

> *"....the third contrivance consisted of small glass bottles which we saw them strike against stone and wood without breaking them. Then they put fragments of flint in the bottles, whereupon these finger-thick bottles, which had withstood the impact of stone, dissolved like flour. When we asked the meaning of this, they said that when glass was cooled in cold water straight from the fire, it became like this. We ascribe this preposterous answer to Frankish trickery." [4]*

The utilitarian spirit was also shared by the Mughals who ruled over India from 1480 until the victory of the British in 1757. In the reign of Akbar, there had been a marked enthusiasm for useful technology. Right-angled gearing, distillation of alcohol and perfumes, lenses for spectacles and telescopes, water-cooling using

saltpeter, etc. made their appearance in India in Akbar's time. Around the middle of the 17th century, large numbers of ships resembling the modern ships of the imperial fleets were built in India. But for all this, and the undisputed magnificence of Mughal architecture, history does not credit them with significant intellectual achievements such as the establishment of universities, observatories, or encouragement of positivistic thought.

Utilitarianism – and thinly veiled anti-intellectualism – is to be found aplenty in modern times as well. For example, the science adviser to the late President Zia, Mr. M.A. Kazi, minced no words on the subject:

> *"In Islam there is no science for the sake of science and there is no knowledge for the sake of knowledge. Everything is for an end, which is using scientific knowledge for the good of humanity at large." [5]*

The Saudis, on their part, have made no secret of their liking for the comforts provided by the wonders of modern technology, and of their dislike for theoretical, scientific knowledge. There is little doubt that they fear the liberating effect it has on the minds of men, and the dangers it holds in store for a rigidly hierarchical and dynastic society where the leaders derive their legitimacy by appeal to Divine sanction. The present dominance of utilitarian values in Muslim society does not augur well for the development of science. When people determine to care for nothing except what is directly and obviously useful, they become incapable of developing abstract thought and creating the intellectual apparatus for science which, by necessity, must be far removed from what is obviously visible or useful. An Iranian physicist succinctly states the case:

> *"Only true spiritual societies have been able to develop science .... it is inherent in a utilitarian society that it is unsympathetic to true spiritual values.... A nation which has no great philosophers will never have any great scientists. Heidegger says that the philosopher is a man who is always capable of wonder. This also characterizes the scientist. The utilitarian man is not capable of wonder. Hence, it is doubtful whether he can develop science." [6]*

2. The Role of Muslim Education

The ultimate values and goals to which a society aspires are to be found in the manner by which it educates its young. It is here where one faces squarely the question of whether the society values transformation and change, or whether it prefers the existing or the past instead. It is useful to clearly enumerate the distinctions between traditional religious education and modern secular education, defining two radically different models of educational philosophy, having two radically different sets of goals and methods. In the jargon of social scientists, these are called ideal types. [7] The contrast will be made between a pure, hence theoretical, version of traditional religious education with a corresponding pure version of modern education.

A Comparison of Traditional & Modern Educational Systems

TRADITIONAL EDUCATION	MODERN EDUCATION
Other-worldly orientation	Secular orientation
Aims at socialization into Islam	Aims at the development of individuality
Curricula unchanged since medieval times	Curricula responds to changes in subject
Knowledge is revealed and unchallengeable	Knowledge is obtained through empirical and deductive processes
Knowledge is acquired because of a divine command	Knowledge needed as a problem-solving tool
Questioning of precepts and assumptions not welcomed	Questioning of precepts and assumptions welcomed
Teaching style basically authoritarian	Teaching style involves student participation
Memorization is crucial	Itemization of key concepts is crucial
Mindset of student is passive-receptive	Mindset of student is active-positivistic
Education is largely undifferentiated	Education can get very specialized

While the notion of "ideal" types is necessarily an abstraction, the above archetypes effectively distinguish between the two fundamentally different approaches to education. It also suggests that the rote nature of education in contemporary Muslim societies can be traced to attitudes inherited from traditional education, wherein knowledge is something to be acquired rather than discovered, and in which the attitude of mind is passive and receptive rather than creative and inquisitive. The social conditioning of an authoritarian traditional environment has, as an inescapable consequence, that all knowledge comes to be viewed as unchangeable and all books tend to be memorized or venerated to some degree. The concept of secular knowledge as a problem-solving tool which evolves in time is alien to traditional thought.

Because the teacher derived his power and authority from unchallengeable sources, the style of traditional teaching was inevitably authoritarian. In Mughal India – as in village schools even today – the teacher (muallim or ustad) sat facing his students arranged in rows of a semi-circle before him. At the end of a dictation or commentary on a text, he would rise with the words "and Allah knows best". Thereafter, the students would reverently kiss his right hand and disperse.

The static, rote-centered concept of education has roots which can be traced back into history, beginning with the Nizamiya curricula devised in the eleventh century. This curricula was faithfully passed onto subsequent generations, and adopted in unchanged form in India. The emphasis was largely on memorization of the Quran and Hadith. Ibn Khaldun, in a comparative study of education in Muslim lands of the 14th century, pointed out that only in Muslim Spain and Persia were subjects such as poetry, grammar, and arithmetic included in the syllabi. Elsewhere, subjects unrelated to the Quran were regarded as being too secular to teach to children. The pupil would copy a verse onto his tablet, memorize it, and then erase it to make space for the subsequent verse. One old book recorded that during the Abbasid period, school pupils used to have Quranic reading half the morning and, except for some recreation, writing for the remainder of the day. On Tuesday afternoons and Thursday mornings, the boys corrected what they had written.

Traditional education, with its emphasis on memorization, created its own standards of excellence and role models. Among those who are quoted is Muhammad ibn-Ziyad al-Arabi of Al-Kufah, who died at Samarra in 840 AD, and is said to have met with a hundred pupils. [8] He dictated to them for ten years, during which time nobody ever saw a manuscript in his hand. Such was his prodigious memory. As another example, a 19th century author says with great awe that "Murarraj had a better memory than other people. He caught a passage from me and remembered it all night long, repeating it the next day, although it was about fifty pages long." Yet another folklore is about a scholar who went from Baghdad to Sijistan to give a course of lectures. In order to avoid carrying books, he memorized the traditions to which he wished to refer. The story was that although he quoted thirty thousand traditions about the Prophet (PBUH), the persons checking his lectures were unable to find more than three mistakes.

Following the end of the Golden Age of Islam around the 13th century, Muslim education had simply ceased to change. The curriculum was so restricted in scope that even Aurangzeb, the arch-conservative Mughal emperor, felt compelled to direct harsh words to his erstwhile teacher:

> *"What did you teach me? You told me that the land of Franks is a small island where the greatest king had previously been the ruler of Portugal, then the king of Holland and now the king of England. You told me about the kings of France and Spain that they are like our petty rulers.... Glory be to God! what a knowledge of geography and history you displayed! Was it not your duty to instruct me in the characteristics of the nations of the world the products of these Countries, their military power, their methods of warfare, their customs, ways of government and political policies? You never considered what academic training is requisite for a prince. All you thought necessary for me was that I become an expert in grammar and learn subjects suitable for a judge or a jurist..." [9]*

What Aurangzeb was pointing out was the narrow scope of learning, which more or less excluded general knowledge and the natural sciences. Religious learnings with grammar and literature as the supporting instruments, totally dominated education. The private curriculum of Shah Waliullah (d. 1761) was relatively wider in scope and included some amount of mathematics, astronomy, and medicine. But secular learning

always remained a low priority among Muslims of the sub-continent. Moreover, even where some degree of free inquiry and experimentation was permitted, the implications of that were firmly limited to the world of inert matter and not allowed to intrude into religious and cultural domains.

This state of affairs persisted until the beginning of the nineteenth century when the British sought to introduce "European Science", and a system of modern management and accounting into the schools of the sub-continent. The two major communities, the Hindus and the Muslims, reacted differently to this decision. The Hindus welcomed it enthusiastically, and pressed the British to give more opportunities for secular education and establish more colleges and schools. The Muslims, on the other hand, looked upon the British decision with suspicion and resentment. In part this was because the British had forcibly put an end to centuries of Muslim rule in India. Hence, "European Science" was seen as a ruse of the enemy for subverting the Islamic religion and culture. The resistance to science was heightened by the characteristic arrogance of the imperialists who openly ridiculed Muslim's past achievements in science. For example, in a speech on 2nd February 1835, Lord Macaulay derisively referred to:

> *"[Muslim] medical doctrines which would disgrace an English ferrier, astronomy which would move laughter in girls at an English boarding house school, history abounding with kings thirty feet high and reigns thirty thousand years long, and geography made of seas of treacle and seas of butter." [10]*

A combination of hurt, pride, defiance, and conservatism led the Muslims to reject modern learning. The ulema were particularly hostile and, after Macaulay's decision of 1835 to introduce modern education throughout India, a petition was signed by 8000 ulema in Calcutta asking the government to exempt Muslims. [11] It is said that the Education Bill was partly responsible for the bloody events of 1857. Parents kept their children away from schools, preferring to either keep them at home or send them to madrassahs. Social pressure, including threats and derision, was applied against the small number of parents who defied the ban. Used to the bygone glories of the Mughal era, Muslims considered most intellectual work, including accountancy and bookkeeping, as fit for low-caste Hindus only. This was the bleak environment in which Syed Ahmed Khan started the battle for Muslim educational reform, a battle which he won but only partly.

To conclude, rote-learning and authoritarianism are the inevitable products of traditional learning, and such learning is natural for a society in self-equilibrium. But when society evolves in complexity, it cannot rigidly adhere to the simplicity of past patterns and must search for solutions which satisfy the needs of progress while maintaining some level of historical and cultural continuity. The inability of the traditional system of education to respond adequately to a changing world may well have been the most critical factor which denied to Muslims the chance of spear-heading the Scientific Revolution.

3. The Role of Muslim Law

The Scientific and Industrial Revolution of post-Renaissance Europe was not a creation of philosophers and thinkers alone; it was a very complex economic and social phenomenon as well. Advances in technology certainly gave rise to powerful new means of production, but it was the European bourgeoisie which harnessed the technical progress and ultimately brought about the metamorphosis of a feudal society into a modern capitalist one. The bourgeoisie, following Marx, can be defined as a class capable of coordinating the means of production and of bringing about fundamental structural transformations by making innovations and investments. Marx, while recognizing the vital role that the bourgeoisie played in transforming society, also identified it as the exploiter and natural enemy of the working class. Asking for why the Scientific Revolution did not occur in Islam is practically equivalent to asking the question: why did not Islam produce an important bourgeois class?

It has been argued, particularly by Weber and his followers, that the nature and practice of Islamic Law was instrumental in discouraging the emergence of a bourgeoisie and nascent capitalism. We shall now explore this claim.

The Weberian argument goes something like this: the existence of a bourgeois class makes essential the existence of a legal system which can resolve disputes on property rights, contractual obligations, banking and financial transactions, etc. Legal judgments should be derivable from rational laws as opposed to arbitrary ones, and the scope of these laws should be broad enough to cover the wide range of problems and cases which occur in a complex economic environment. New laws are needed for new situations, and these must be consistent in spirit with the existing laws. Legal rationality is a pre-requisite for modern capitalism; without a systematized and comprehensive legal system, the economic system would soon fall to pieces. The secular and rationalized legal framework needed for the emergence of capitalism, the argument continues, is incompatible with the nature of Islamic law. The latter is inseparable from ethics and religious belief, and as such is not rooted in clearly definable principles. It derives entirely from the revelations and traditions of the Prophet. The legal activity of a Qazi (judge) amounts to discovering a sacred legal tradition and holding that as applicable to the case in hand. In Islam, claim the Weberians, there is no law-making, only law-finding. The absence of a sharp distinction between Islamic ethics and law means that a systematized legal system cannot be brought to the service of the bourgeoisie in order to protect private property within a comprehensive, rational system. Weber argued that because:

> *"religious courts had jurisdiction over land cases, capitalistic exploitation of the land was impossible, as, for instance, in Tunisia. The whole situation is typical of the way in which theocratic judicial administration has interfered and must necessarily interfere with the operation of a rational economic system." [12]*

In formal and textual terms, Weberians are right in arguing that the Islamic Shari'at is hostile to important elements in capitalism, and that it is an almost immutable set of rules which cannot be changed according to

the times. As a matter of fact, the four legal schools operative among Sunnis today are unchanged from the time that they were founded, respectively, by Malik ibn Anas (d. 795), Abu Hanifa (d. 767), Mohammed ibn Idris al-Shafi'i (d. 820), and Ahmad ibn Hanbal (d. 855). The differences between them stem entirely from the different weights they attach to various Quranic verses and the degree of validity which is assigned to various Prophetic traditions. Between these schools, all major problems of Islamic jurisprudence had been resolved by the end of the 11th century. With this the doors of Ijtihad were formally closed.

But the actual impact of the Shari'at in determining the direction of economic development in Muslim society cannot be inferred from formal arguments alone. In actual practice, various injunctions of the Shari'at have been effectively bypassed by Muslims throughout the ages whenever important economic or political interests have been at stake. The French Islamicist, Maxime Rodinson, argues that, for example, the Islamic prohibition on lending money at interest had never stopped the practice of usury on a large scale in Muslim society. The practical effect of the ban was to create ingenious methods of circumvention. These methods have a name in Arabic: hiyal, meaning ruses, or wiles. Entire books, dating back to the ninth century, are devoted to expounding various forms of hiyal. Rodinson's book "Islam and Capitalism" contains a fascinating account of the past and present practice of circumvention.

Exponents of the Shari'at argue that it encompasses current legal and economic issues such as international trade, joint stock companies, loans from foreign donors, principles of taxation, etc. Nevertheless, all Islamic countries have definite rules governing such matters which derive from secular, universalistic legal principles. It could be argued, for example, that Islamic law should bar Islamic countries from accepting loans with interest from non-Islamic or Islamic countries. But in practice the Shari'at has not influenced the attitudes on this issue. In their internal policies, modern Islamic states pay only lip service to the Shari'at. For example, the insistence of certain fundamentalists that all depictions of a human face be banned has not prevented the modern state from imposing the requirement that citizens possess identification cards with pictures, or led to a ban on television broadcasting. The need of the state to impose its control over the population is clearly the dominant force. One can identify numerous other instances where even religious authorities transparently violate the Shari'at - in spirit if not in letter. An example is provided by the refusal of the local ulema to condemn the heroin trade in the deeply religious area of Pakistan's Frontier province. The religious arguments sometimes given to legitimize trade in this narcotic are entirely specious. Clearly, material interests are capable of overpowering moral, ethical, and religious considerations.

To conclude: the development of capitalism in Islamic lands would have been favored by a relatively fixed set of codified rules based on rational principles. For example, the emergence of institutionalized banking along European lines would have been easier. On the other hand there is no compelling evidence that in actual practice the Shari'at prevented the Muslim world from developing along this road. Our search for the causes of non-development of a modern industrial Islamic culture therefore cannot end here.

4. Economic Causes

When Muslim lands were invaded and colonized by imperial powers in the eighteenth century, Muslim society was in a state of frozen medievalism. There was no Islamic bourgeoisie which could use advances in technology to bring about the transformation from a feudal society to a capitalist one. However, it is sometimes claimed that India and Egypt were at the point of arriving at a capitalist socio-economic formation when the onset of colonial rule interrupted their natural development. Such claims cannot, of course, be rejected. But two other elements also militated against the growth of an indigenous bourgeois class: the existence of an urban ruling class based on a stable system of extraction from the peasantry, and the absence of autonomous cities and trade guilds which played such an important role in the development of European capitalism. These two factors will be examined more closely below.

Extractive Economy

Whether the case be that of Arab lands under the Ottomans or India under the Mughals, Islamic civilization has been very definitely urban based. Villagers had had little cultural contact with the city civilization aside from selling produce to city-dwellers, and they lived a remote and backward existence in an entirely self-enclosed world. Caliphs and kings appointed local governors and officials who ensured that peasants would continue to supply revenue and food. Even in conditions of famine, the city would be better off than the village. The parasitic dependence of the city on the villages, and the assured supply of food and revenue, substantially reduced the incentive for technological advances in production. In this pre-capitalist society, the aim of production was immediate consumption, albeit regulated by traditions and the prevalent hierarchical structure. The aim was not the improvement or development of new productive forces. The stability of this system of extraction may explain why Indian society under the Mughals, though brilliant in many respects, remained essentially medieval. A noted economic historian of India, Dr. Irfan Habib of Aligarh Muslim University, first raises and then answers the question of why Mughal nobles and learned men showed so little urge in obtaining knowledge of mechanical devices:

> *"An explanation may lie in the economic position of the Mughal nobility. The Mughal ruling class was based on an internally stable system of extraction of agrarian surplus, its transfer to towns through sale of foodstuffs and raw materials, and the existence in the towns of a large urban population offering craft-goods and services of all kinds. So long as an internal agrarian crisis did not break out, the Mughal ruling class had little scarcity of resources and little sense of deprivation in not obtaining the mechanical toys from Europe. Only in war weaponry was this need felt; and this could be met by importing European guns as well as gunners." [13]*

Habib also explores the possibility that the fairly sizable amount of merchant capital which existed could have been a source for investing in new technology, and hence that, left to itself, Indian society capitalist development would have soon followed. But the conclusion is negative:

> *"Workshops or karkhanas owned by them also existed. But these were set up mainly when the raw material was too expensive to be given out to the artisans at home. The tools apparently remained those of the artisan. Thus there was no development of even primitive machine-capital, which might in time have attracted larger investment for the installation of technological improvements. There is the possibility too that the merchants earning excessively large profits out of the commerce in commodities and luxuries for a very small ruling class possessed immense wealth had little inclination to invest in devices that were irrelevant to the established commercially rewarding trades. In essence, then, we come back to our major thesis that the agrarian exploitation pursued successfully by the Mughal Empire made its economy immune, by and large, to the temptations of imitating European technology until it was too late." [14]*

Autonomous Institutions

In his analysis of the rise of European capitalism, Weber argued that the autonomous European city was important to the growth of a free association life, as well as the development of trade and professional guilds, and hence was instrumental for the emergence of a unified social and legal community. Most European cities in the Middle Ages were legally autonomous, maintained garrisons, and were internally cohesive in the face of external challenges. This was made possible because these social institutions were not set within a rigid, lasting patrimonial order. Weber credited the particular nature of Christianity for stimulating this growth in social order, but his arguments in support of this contention are not very convincing. Nevertheless, the importance of autonomous social institutions does seem to have a logical bearing on the development of capitalism. In this context, the tradition of Islamic city life appears to have been rather different as compared to European cities. In Muslim lands, cities were externally controlled by the ruling dynasties and trade, transport, and military life was dominated by them. External control meant that municipal institutions either did not develop, or had little effective role in governing the life of the city. Therefore, instead of being an integrated whole, the city in Arab lands as well as Mughal India was a collection of heterogeneous self-contained cells which regulated mosques and other community facilities. Affiliation to a particular group or sect was an important part of the social consciousness. Elements of this structure are visible today as well.

It has been argued that while the fragmented nature of city life did not allow for the development of corporate institutions, Islamic craft guilds were quite similar to those in European cities. [15] As a matter of fact, guilds or corporations are known to have existed in Islamic society as far back as the 9th century. They included professions ranging from jewelers, doctors, teachers, water carriers, carpenters, and even prostitutes and thieves. However, the degree of control over the guilds by the external authorities was considerably greater. Perhaps the major motivation was to prevent the guilds from emerging as focal points of resistance to taxation. So, the guilds were in fact created and controlled by the state which determined norms of work, organization, training, the type and quality of work, and the prices at which finished goods could be sold. It is perhaps indicative of the extent of control that in 1807 strict orders were issued to the cobblers of Istanbul not to make boots, shoes, and slippers with pointed toes as these were contrary to ancient tradition. [16]

It seems to be the case that:

> *"Islamic guilds were not, therefore, organizations created by workmen to protect themselves and their craft; they were organizations created by the state to supervise the craft and workmen and above all to protect the state from autonomous institutions." [17]*

Extrapolating from the European experience, one can surmise that the existence of autonomous institutions would have stimulated the growth of industry in Islamic lands and allowed it to maintain the lead which it possessed over the rest of the world until the fourteenth century. At that time, the industry in Islamic lands consisted mainly of paper making in Iraq, Syria, North Africa, and Spain; production of textiles, clothes, carpets, shoes, etc. In Spain there was open mining of iron ore and copper, shipbuilding, and metal-working. Unfortunately metal and machine industries did not exist and industrial goods from Islamic lands could not compete with the rapidly industrializing West. Although some of the ancient crafts such as glassmaking, metal-working, etc., did retain their fine quality, by the beginning of the eighteenth century the symmetry which had once existed between East and West had been totally lost.

5. Political Causes

In 1258, when the Mongol marauder, Hulagu Khan, sacked Baghdad, he had the reigning Caliph kicked to death and the Abbasid Caliphate was abolished. Chroniclers of the times said that 800,000 corpses were heaped up on the streets of the city. Irrigation works were destroyed, and conditions of famine arose. What had once been the center of Islamic culture and civilization was now no more. But, it is important to note, disastrous as they were, the Mongol depredations came at a time when Islamic civilization had already entered a state of decline. The Caliphs had lost their power to secular sultans, and the institution of Caliphate had been tottering at the time it was abolished. Further, though the damage inflicted by the invasions was considerable, their effect was localized to Iraq and, to a lesser extent, Syria. The Muslim civilization in Spain and the Maghreb was unaffected. Moreover, the marauders gradually converted to Islam and began a new period of cultural and economic development. One cannot, therefore, blame external political factors alone. Indeed, there were elements internal to the society which played a very important role in arresting its economic, political, and intellectual evolution.

The fact that a powerful Islamic capitalist bourgeoisie did not emerge, and the weakness of autonomous institutions like cities and trade guilds, was closely connected with the fact that the caliphate in Islam – setting aside the case of the first four pious Caliphs – was not determined by institutionalized, well-defined procedures which would ensure continuity of policy or encourage alternate centers of power. In principle, as in Al-Mawardi's theory of the Caliphate, the Caliph was supposed to conform to high ideals of piety and justice. But, in practice, the reins of government could be seized by intriguers, or those who wielded the greatest power. The divorce of ethical ideals from the exercise of temporal power by caliphs was recognized by Al-Ghazali:

> *"An evil-doing and barbarous sultan, so long as he is supported by military force, so that he can only with difficulty be deposed and that attempt to depose him would cause unendurable strife, must of necessity be left in possession and obedience must be rendered to him, exactly as obedience must be rendered to emirs Government in these days is a consequence solely of military power, and whoever he may be to whom the holder of military power gives his allegiance, that person is the caliph." [18]*

In comparing Islamic political history to that of Europe, one is immediately confronted by the radically different way in which religion entered the sphere of politics. The Christian Church was an all-powerful institution which commanded the total allegiance of its subjects and which, from the center of papacy in Rome, made and un-made kingships as far away as England and France. The tyranny exercised by the Church left no room for dissent. The inquisitions it instituted against suspected heretics form one of the most dreadful chapters of human history. Only after the Lutheran Reformation was its authority tempered. In contrast to this, Islam had no Church and no formal center of tyrannical religious authority. Thus the level of persecution of Islamic scholars and thinkers was much less than in Europe; there is nothing like the Inquisition in Islamic history. One can credit this fact to the nature of the Islamic belief, which admits a greater freedom of interpretation of doctrine. But this freedom also led to the absence of a central political-religious authority which could resolve or mediate disputes. Usurpers could seize state power and claim religious leadership, they could turn disputes over territory or power into an occasion for jihad (holy war), or they could mobilize religious sentiments of the masses to suppress minority or unorthodox religious groups. The process of splintering into new sects was also aided by the absence of a centralized Church. Paradoxically, a superior moral position – the right of the individual to interpret doctrine without the aid of priests – appears to have led to a systemic organizational weakness which proved fatal to Islamic political and economic – not to speak of scientific and technological – power in the long run.

Notes & References

1. Averroes, *Tahafut Al-Tahafut (The Incoherence of the Incoherence)*, translated by S. Van den Bergh (London: Luzac and Co., 1954), I, pg 318.
2. Ibn Khaldun, quoted in *The Arabs* by Peter Mansfield (Penguin Books, 1987), pg 102.
3. Quoted in B. Lewis, *The Muslim Discovery of Europe* (New York: W.W. Norton, 1982), pp. 232-233.
4. Ibid., pg 232.
5. M.A. Kazi in *Knowledge For What*, (Proceedings of the Seminar on Islamization of Knowledge, Islamic University, Islamabad, 1982).
6. Mohammad Hussein Saffouri in *Islamic Cultural Identity and Scientific-Technological Development*, Klaus Gottstein (ed.), (Baden-Baden: Nomos, 1986), pg 92.
7. An informative discussion on the past and present of Muslim education can be found in *Modernization of Muslim Education* (Lahore: Islamic Book Service, 1983).
8. *Muslim Education in Medieval Times*, Bayard Dodge (Washington DC: The Middle East Institute, 1962), pg 11.
9. S.M. Ikram, *Rud-i-Kawthar* (Karachi, 195~), p. 424-426, quoted in *Islam* by Fazlur Rehman (London: Weidenfeld and Nicolson, 1966), pg 187.
10. H. Sharp, *Selections from Educational Records: Part I (1781-1839)* (Calcutta: Govt. Printing, 1920), pg 110.
11. Maulana Hali, *Hayat-e-Javed* (Lahore, 1957), pg 447.
12. Max Weber, *Economy and Society* (New York: G. Roth and C. Wittich, 1968), v2, pg 823.
13. Irfan Habib, "Changes in Technology in Medieval India", paper presented at the Symposium on Technology and Society, Indian History Congress, Waltair, 1979.
14. Ibid.
15. Bryan S. Turner, *Weber and Islam* (London: Routledge and Kegan, 1974), pp. 100-106.
16. H.A.R. Gibb and H. Bowen, *Islamic Society and the West* (London, 1950), v.1, pg 283.
17. Turner, op. cit., pg 103.
18. Al-Ghazali in *Ihya* II, 124 (Cairo, 1352), quoted in *Studies on the Civilization of Islam* by Hamilton Gibb (Princeton, 1962), pp. 142-143.