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THE DISTORTION OF SCIENCE*

URMIE RAY

To gauge how we have reached a situation where life is becoming increasingly akin to survival, where the continuation of civilizations or even the physical continuation of our species is imperiled by multiple sources of pollution and the incessant threat of all-annihilating wars, the role of science must be thoroughly assessed. The modern world cannot otherwise be veritably understood.

Now, beauty is the first thing that strikes the reader of the works of the great scientific minds who at all periods and in all cultures have helped us achieve our highest humanity. The hazards we now face cannot stem from such beauty and clarity of thought. Rather they are due to a distorted version of science.

1 Defining Science

To begin with, it is necessary to try and identify what science is about, which is far from straightforward. The criticality of investigations of the external world was evidently recognized from early on since otherwise we probably would not have endured long. What their characteristics should be if we want our conclusions to be reliable were well assessed and sophisticated methodologies elaborated long before the Christian era, at least by some schools of thought. Science is the outcome of our development of such investigations. It used to be considered part and parcel of knowledge as a whole. No equivalent of our current narrow connotation of the term 'science' can be found before the nineteenth century. As late as 1828, the first edition of Webster's dictionary describes science as consisting of "grammar, logic, rhetoric, arithmetic, geometry, astronomy and music".

Although the subdivisions have to some extent varied according to the evolution of our understanding, what we today call the sciences in the plural go back a long way. It is only in 1833 that they were

* This is a Revised Version of the paper presented on 9th March, 2018 at the Asiatic Society as a Special Lecture.

brought under the purview of a unifying label when the generic word 'scientist' was formally suggested by mathematician William Whewell.[1] Namely, the common points between these fields were then recognized to be of sufficient import to list them under a single category and to distinguish them from other branches of learning. According to Whewell, on the one hand, "the students of books and of things" had become "estranged from each other in habit and feeling", and on the other, it was necessary to highlight the "unity" behind the pursuit of "knowledge of the material world" as the various disciplines it consists of were becoming isolated through increasing over-specialization. In fact, it is rather the realm of the *sciences* in the plural that he delimitated, not that of *science*, a term he continued to employ in its traditional sense of praiseworthy erudition. Since his days the focus has switched back and forth between the underlying unity and the diversity of the various sciences.

There is a strong case for returning to the term science some of its earlier broadness. It would reestablish science within a larger context. But too broad a definition would defeat our purpose, namely the determination of the root causes of our current predicament. A genuine question concerns applications of scientific knowledge. Should they be included within science as in the recently revised definition of science* by the British Science Council? I opt not to because it raises more questions than it answers regarding the distinction between science and technology. This said, application purposes may well be a motivation behind a scientific inquiry, possibly the principal motivation; conversely, a scientific inquiry may result in applications, even when applications are not envisaged initially. In all cases, applications may be pursued by scientists themselves or by third parties.

One should however be wary of too narrow a definition that would make science equivalent to the science that evolved in Europe. Too exclusive a categorization forces the incessant creation of new categories each time you come across something that is sort of like

* "Science is the pursuit and application of knowledge and understanding of the natural and social world following a systematic methodology based on evidence."

something already classified but not quite. This hinders the identification of the essential properties of whatever is being classified by including its secondary properties within its definition. As a consequence, the adequateness of these secondary properties cannot be properly analyzed. This in the case of science is especially problematic since, as pointed out by John Stuart Mill, "the definition of any term in science" is under constant modification. The definition thus has to be sufficiently flexible since "it may easily happen that a different set of characteristics will [in the future] be found to be better adapted."[2]

1.1 Communicability

To begin with, we need to have a clear idea as to what the domain of science consists of. For our investigations of the external world to be in any degree reliable, they must be communicable to others, so that the conclusions can be verified. Thus science can only proceed through the study of describable features perceptible to our senses. More precisely, absolute concepts such as colour, heat or height, although they are certainly part of our experience of life, have no place in science for there is no way of ascertaining how two different individuals perceive them. What can be communicated and agreed upon is whether or not two sense perceptions of the same type are identical or different and to what extent, for example if two roses are of an identical hue or not, or whether an object is taller or shorter, nearer or farther, and so on. In other words, only attributes that are associated to pairs of opposites and that can be directly or indirectly observed with reference to something else are liable to scientific scrutiny.

This said, to specify the domain of science as the material world as Whewell does suggest that reality is either restricted to it or that there are clear boundaries between the material and non-material sphere, and thus de facto supposes that the causes can be found in the material sphere; any possible eventual influence of the non-material on the material is ignored. In short, it is an assumption.

Replacing the material world by phenomena is in some ways an improvement as it leaves its material dimension unstated. However,

according to the online edition of the Oxford English Dictionary, a phenomenon is a "fact or situation that is observed to exist or happen" or the "object of a person's perception". This still leaves room for ambiguity. Indeed, to infer the properties of a phenomenon, science is forced to invent imperceptible concepts such as energy or atom – two of the cornerstones of modern science. These concepts are suggested by observation, and their soundness confirmed by investigations of their indirect perceptible describable effects. Nevertheless, we have no way of determining whether our concepts are veritable phenomena or pure constructs of the human mind to account for mundane experience. At the very least, they are indefinable from within science, a mathematical rendering being akin to translation into another language not explanation.

Defining the domain of science as the "natural and social world" is ambivalent as it might induce the reader to believe that man the observer is not part of the observation, namely of the natural world, which physics in the last century and then biology have shown to be wrong. Furthermore the social world might be amenable to "a systematic methodology", but it is little amenable to a reproducible one, the critical characteristic of a communicable approach: verifiability entails reproducibility. The observations and experiments must be reproducible, that is they must be replicable in slightly different conditions, given that the exact same conditions never occur twice, and the conclusions must nonetheless agree; mere observation is not sufficient. A reproducible study must perforce be systematically conducted, but the converse does not necessarily follow. Reproducibility entails another basic characteristic – transparency. The data and procedure followed must be made known to all interested parties.

This highlights the importance of explicitly stating the basic methods of science in order to distinguish it from other forms of knowledge. More than the results what matters are the justifications provided. Hence, while avoiding the reduction of the complex process towards scientific knowledge to observation based reasoning by characterizing science as rational knowledge, the definition ensures that conclusions merely guessed intuitively from observation cannot

be considered scientific until they are supported by reasoned arguments: obtaining satisfactory results might be sheer coincidence. Note that the term 'observation' is less controversial than the term 'evidence'. Etymologically, the latter is derived from the Latin 'evidentia' signifying obvious. However, the need for science comes precisely from the necessity to go beyond the superficially obvious as it can be misleading.

Indeed, to proceed scientifically is to proceed using common sense, the difference between a scientific and a more mundane approach being one of degree rather than of kind, but to do so by making more accurate the similarities and differences between comparable objects and concepts. Observation must be taken beyond the superficial to lessen ambiguities. For instance, we all have some idea of what fruits and vegetables are and this serves most of us fine. The ordinary usage is founded on association with instances we have come to consider as similar for vague reasons, possibly cultural ones. Fruits are, for instance, popularly regarded as the product of trees. However, the scientific definition is that of an organ that contains seeds, and which protects these as they develop and often aids in their dispersal. Therefore, tomatoes and cucumbers are fruits, contrary to the widely held belief that they are vegetables.

Another point worth insisting upon is that a concept or a phenomenon can be said to be understood with some degree of satisfaction when so are both its intrinsic properties and its interactions with the external context, implying the need to study it both in isolation and in its natural setting over time and space since some effects and their range may not be immediately noticeable.

In summary,

Science is the observation- and reason-based reproducible study of the describable properties of phenomena and of the concepts thereby inferred, including their interactions with other phenomena and concepts.

The term phenomena has been left unqualified to include both manmade ones and those not requiring human agency.

This definition has the advantage of diminishing discords regarding what can or cannot be included in a scientific theory. In particular,

absolute concepts such as God are off-limit as they can neither be verified by reproducible observation, nor, to quote Immanuel Kant, can "reason ... penetrate beyond the limits of experience",[3] more precisely experience describable through the logic inherent to language. In Rabindranath Thakur's* words, "the absolute truth, which cannot be ... described by words ... cannot belong to science."[4] Science can in no way confirm or refute religious or metaphysical conclusions. Any affirmation going beyond the sphere of pairs of opposites belongs to the domain of faith, and is founded on personal non-reproducible and thus non-communicable experience.

By including concepts, the definition also aims to prevent a widespread misunderstanding. For all its merits, science, like all human knowledge, fails to reach the level of objectivity all too often attributed to it.

1.2 Observation and Ideas

Science certainly rests on observation. If "it disagrees with experiment, it is wrong. In that statement is the key to science",[5] to use physicist Richard Feynman's words. Or to quote chemist Dmitri Mendeleev: "in science we all must submit not to what seems to us attractive from one point of view or from another, but to what represents an agreement between theory and experiment".[6] Yet, as already emphasized, it also rests on ideas. This was aptly pointed out by Whewell: "[a]t each step... are needed invention, sagacity, genius – elements which no Art can give".[7] In effect, observation and ideas are inextricably connected.

Indeed, the whole process of observation is extremely complex and subjective. It is not possible to observe outside a theoretical framework. In mathematician Henri Poincarī's words, "the scientist does not choose at random the facts he observes."[8] Our senses are at every instant submerged by innumerable external data and every phenomenon has multiple aspects. The human mind cannot take notice of them all. So you need to rapidly have some inkling of what it is you wish to observe and why. The search for empirical data for or against a hypothesis must be preceded with some idea of what

* Also known as Tagore. The transliteration Thakur is closer to the original Bengali name.

would constitute such data. There cannot be any systematic observation without preconceptions. As stated by Feynman, "judgment about what to observe and what to pay attention to" plays a "vital" role.[9] "All observation", Darwin remarked, "must be for or against some view if it is to be of any service."[10] Thus ideas enter science from the very beginning. Once what to observe and how has been determined, the data obtained needs to be interpreted. Not only is it not possible to observe in a theoretical vacuum, but it is also not possible to make sense of the observation made. Ideas give observation meaning.

On the other hand, observation keeps flights of fancy in check. Ideas in science cannot be free inventions of the human mind. They must be suggested by observation, and verified by observation. Observation enables us to overcome preconceived ideas that are incompatible with existing data and suggests better suited ones.

Observation alone does not amount to science, nor do theoretical speculations unconfirmed by observation. It is the dynamic and subtle interplay between theory-building, on the one hand, and systematically conducted, communicable observation, on the other, which forms the essence of science and which distinguishes it from other creative activities and approaches to knowledge. The best of science emerges when a satisfactory equilibrium is found between experiment and hypothesis. Finding this equilibrium is itself a matter of fine tuning and thus of subjective insight as to when the initial theory requires modification, or when it requires setting aside.

1.3 "Science Knows No Final Truth"[6]

It follows that subjectivity cannot be avoided. Furthermore, in the same vein as above, nature, the universe or life in its entirety do not belong to the domain of science: the whole is not observable nor comparable. Science can only study the particular forms these take, namely their parts, and the relations between them. We have no option but to proceed "by selecting certain details and isolating those (either wilfully or unconsciously) from the rest". For philosopher Edward Carpenter we must therefore "suppose what is false" since nature is one whole unit, a unit beyond the apprehension of the human intellect, and this "vitiate[s] our conclusions."[11]

In particular, a mathematical approach involves substantial information loss if only because all unquantifiable qualitative features are discarded. It can only address patterns formed by identical objects. In other words, it eliminates their individual features; it standardizes. It sets aside all that differentiates and only keeps some common properties. Besides, mathematics can only tackle a very limited number of parameters, and there are many scientific questions that are in principle computable, but in practice cannot be computed because the time taken, the resources needed, and so on, are too extensive. As a result, mathematical assumptions, namely the selection of parameters and relations they satisfy, tend to be made for the sake of mathematical convenience, not for any justified scientific reason. It cannot therefore be concluded that quantification lessens the inaccuracy or subjectivity of qualitative assessments. A descriptive theory can be as telling as a string of mathematical symbols. This is what Charles Lyell, one of the founding fathers of modern geology, has to say about the methods used in his field: "by the geologist myriads of ages were reckoned, not by arithmetical computation, but by a train of physical events – signs which convey to our minds more definite ideas than figures can do of the immensity of time." Such an achievement is in no way of lesser value than that of the "geometer" by whom "were measured the regions of space, and the relative distances of the heavenly bodies."[12] Each method is appropriate in its own realm, each has its own weaknesses and strengths. Quantification must be complemented with qualitative assessments to better encompass the complexity of the reality studied by science.

In other words, irrespective of how holistic our approach is, science must inevitably proceed through a series of approximations. As our instruments and data improve, more details, more factors, in other words more complexity, can be taken account of, and the effect of each can be better determined. As a result, our former descriptions are refined, they become less rough. However, this should not be interpreted as taking us nearer and nearer to the truth. Science can never tell us what the truth is, how near we are to it. What it does is guide us away from untruths.

A fortiori, scientific theories do not mirror reality, or if they do we cannot know this to be the case since we can only apprehend

reality through our human senses and mind. They are our interpretations of reality, and, as suggested by Carpenter, should be regarded as working hypotheses. At each moment, we can decide to take a different path; in particular, we can infer equally reasonable alternative explanations from existing clues. If one theory is favoured over another it is often a matter of reigning cultural paradigms or of the propensity of the human mind to prefer a certain type of arguments over another: simplicity is a frequently used criterion if only for reasons of technical convenience. For instance, Dirac challenged the use of constants in physics and postulated that these numbers are connected by a simple mathematical relation. The relation he gave includes a time factor. As a result, the rates of radioactive decay become time-dependent, and his hypothesis, if correct, would have serious repercussions not just in several scientific domains, but also in history since this alters the current estimations from radiometric dating. In the absence of uncontroversial evidence to the contrary, because of the difficulty added by a time factor, physical 'constants' continue to be assumed to be immutable.

In short, scientific knowledge is in a constant state of unfolding. Its weaknesses are its strength. Scientific contentions are the exact opposite of dogmatic pronouncements. Science is by definition the only approach to knowledge with in-built doubt about its own statements, in other words an approach acknowledging that its theories are open to modification, if not to complete repudiation, that they are ephemeral and in a constant process of revision, but of a revision that must itself conform with the data available.

2 From Church Christianity to Modern Science

2.1 The Establishment of Church Christianity and Its Consequences

The roots of the distortion of science lie in the fourth century when emperor Constantine established Church-Christianity.* In Leo Tolstoy's words, these teachings "voiced [their] doctrine of equality

* The following concerns this doctrine, and it is in this sense that the expression is used in this article; it should in no way be construed as a comment on the teachings attributed to Jesus, nor on any later theology taking its inspiration from them, nor even on later changes of perception within the Church itself.

between all men with [a] clarity" that was unprecedented, and hence he contended that it "was necessary to use special force to distort the teaching and conceal its basic clause".[13]

Church-Christianity together with its founding book, the Bible, is Constantine's brainchild. A hodgepodge of the diverse and clashing beliefs of the time, everything and its contrary can be found in this treatise, thereby diluting Jesus' message. The latter's transformation away from its ethical content into the acceptance of common sense defying beliefs, notably the factuality of his resurrection, had been going on within some sects for some time. These were now given the seal of official approval, and established as the founding criterion of the official religion. The transcendental sphere is certainly beyond common sense, but unlike Eastern religions and philosophies, more and more supernatural elements were claimed to have veritably occurred within the sphere of common sense. Thus discussions became increasingly focussed on questions of objectivity and hence of truth. This was in some ways in line with the Greek emphasis on certainty and truth, but made to serve a faith contradicting observation and common sense, which Aristotelian thinkers did take exception to. To quote Aulus Celsius from the turn of the Christian era: "God ... [cannot] desire what is contrary to nature. ... He himself is the reason of everything that exists; therefore he is not able to do anything contrary to reason or to his own character".[14]

Now, as explained by Bart Ehrman, distinguished professor of religious studies at the University of North Carolina, only authoritative eye-witnesses, who can be trusted for their truthfulness, can account for the veracity of events that do not conform to our usual experience, especially when these events are said to have occurred in a past not so distant that it can be imbued with mythological dimensions. However, with time, no one could claim to have met any eye-witnesses. The absence of any written records by the original initiators of Christianity made it easier for later texts to be falsely signed in the name of Jesus and his companions. According to Ehrman,[15] there was a deliberate intention to deceive readers. For this amounts to what he calls "forgeries" and "forgery was largely condemned" in the Greco-Roman world; so recourse to

it was deliberate. How sophisticated the process of lying by insisting on truth had become is well illustrated by the Second Letter to the Thessalonians: itself falsely claiming to be authored by Paul, it warns readers about the existence of forgeries in the name of Paul.

Whatever might have been the reasons for having recourse to such methods, they helped enforce a single world-view on increasingly disparate peoples, a world-view determined by the Church and imperial authorities: one god, one church, one "Ruler of the Whole World", as engraved on coinage from Constantine's time. This enforcement followed the reunification of both the Western and Eastern empire under his sole rule, when he reversed his former policy of tolerance, which he had implemented after taking over solely the Western part. The victims this time were non-Christians and anyone considered heretic. It has now been established that he "spoke out on Non-Christians", whom, according to Ramsay MacMullen, emeritus professor of history at Yale, he "would have liked to obliterate. ... But lacking the means for that ... he had to be content with robbing their temples."[16] As for the concept of heresy, namely that any interpretation of Jesus' teachings differing from Church-Christianity is wrong, it became solidly established in his days. Based on sources and evidence from this period, McMullen concludes that a "conformity of cult" was ensured through "physical coercion" wherever necessary.[17] Although Constantine later relented on his persecution of the orthodox faith, and granted some Christian heretic sects religious freedom, he did persecute others, evidence for which can be found in historian Edward Gibbon's 'History of the Decline and Fall of the Roman Empire'.[18] This was in particular the case of the Donatists. In an epistle he sent Church authorities in 325, he ordained that "any treatise composed by Arius [shall be] consigned to the flames, in order that not only his depraved doctrine should be suppressed, but also that no memory of him may be by any means left. This therefore I decree, that if anyone shall be detected in concealing a book compiled by Arius, and shall not instantly bring it forward and burn it, the penalty for this offense shall be death".[19]

His successful enforcement of a unique world-view can rightly be described as "one of the most important revolutions" in history, as

does Gibbon.[20] This single event brought to an end the many burgeoning thoughts within the empire before they could ripen – a fundamental difference with Asia, where within each cultural unit, a multiplicity of powerful ontologies had developed from early on. What is more, the nature of the world-view and of the methods for its elaboration created sufficient confusion between truth and untruth and sufficiently stifled common sense to make the exercise of critical judgement hard. Thus, after the fall of the empire, for several centuries, the Church was able to build a monopolistic all-powerful structure and its repressive machinery could be brought to bear against rare critics. As population after population came to adopt this view voluntarily or under compulsion, they identified with its goals – the expansion of the Church's wealth and dominion – and participated in their implementation. For this world-view claimed objective truthfulness, and thus the falseness of all other belief systems, and the exclusion from salvation of anyone who rejected it, thereby making it a matter of duty to bring all humans within the compass of the one and unique truth represented by the official criterion of Christianity. Some 1500 years down the road, the doctrinal hold of the Church has been seriously damaged by the consolidation of a scientific spirit, this or that dynasty has come and gone, so have a palette of political regimes, but the expansionist uniformization in the economic interests of a Europe, and now West-centric, elite, has never abated and now has global reach, thanks to a secular version of Constantine's brilliant method. Jesus has merely been replaced by science.

I would like to stress that in this article I am not interested in discussing the rise and evolution of Europe's scientific spirit, nor its remarkable contributions to human civilization, but the distortion of this spirit, as this distortion is the root cause of present global issues. Notwithstanding its distortion, European science is evolving beyond its initial assumptions, precisely because science has an in-built self-correcting mechanism, and because the human mind everywhere is able to leave behind its past convictions when his reason and experience warrant it. Likewise, the scientific decadence elsewhere, in particular in the Indian subcontinent, due to the increasing

stranglehold of religious orthodoxy is not addressed as it is not directly relevant.

Neither do I want to go into the details of the economic interests behind the need for distortion. In short, following the example set from the beginning by the Church and initially encouraged by the successive emperors, a culture of wealth maximization rather than optimization as in Asia had begun to take root. The outcome was a move away from merchant capitalism towards financial capitalism, namely a capitalism where commodities become shadows; from a tool, finance was transformed into the motor of the economy. Rather I want to address the fallacies pertaining to the manner in which science came to be viewed, enabling its eventual distortion.

Accepting causal untruths about the world in the name of truth and their enforcement through Orwellian methods for more than a thousand years has left profound traces on European society. The upheaval brought about by growing scientific knowledge must have resulted in feelings of confusion and disorientation.

As late as the turn of the twentieth century, Kelvin was still denying that the earth was billions of years old, and until at least the 1950s, lateral motion of continents was a virulently opposed thesis simply because it did not fit into official Christian dogma.

In Catholic Europe, in a context of open antagonism and religious repression, scientific argumentation emerged out of the need to placate the Church and oppose its doctrines. In Britain, science became associated with the new religious body: membership of the Royal Society entailed taking an oath on the "Holy Gospels of God". This suggests an implicit acceptance by the organization meant to promote science that the 'Gospels' are the word of God, hence represent a unique truth, when in effect they contain numerous forgeries and fabrications of an unscientific nature. In short, the relationship between European science and Church Christianity has been ambiguous from the outset. Outside Europe, connections between the scientific world and authorities of a religious nature had been a personal matter, not an institutional one.

Consequently, on the one hand, the hidden assumptions underlying Christian dogmas remained unidentified and were

introduced into science; on the other, new dogmas in direct opposition to its Christian tradition were elaborated in the name of science. This is not to say that scientists and philosophers did not identify the nature of science before the twentieth century, but rare are those who did so fully. As for the others, their shortcomings have been more influential than their insights.

2.2 Misconceptions About Science

In this context, following from the Christian and Aristotelian conviction in the existence of objective truth, science came to be regarded as the means to uncover this objective truth, this conviction being consolidated by the belief in the objectivity of mathematics. A mathematics regarded as axiomatic in the Aristotelian sense, where theories are thought to arise deductively from premises regarded as self-evident, had been accepted by Church theology as the means of establishing its doctrines on indisputable grounds, long before the rise of a proper scientific spirit. Indeed, the premises can be taken to be anything wished, as long as internal coherence is maintained. The success of Newton's physics, from which early modern science largely takes its inspiration, reinforced the belief in the success of a science set out in mathematical and axiomatic form. That, like Euclid's geometry,* it rests on a mathematics which falls short of its axiomatic ideal, was not properly appreciated. In the eighteenth century Encyclopedia of D'Alembert and Diderot, science is defined as "the opposite of *doubt*" and as "clear and certain knowledge ..., founded on self-evident principles".

Belief in the objectivity of science began to be undermined in the 1830s when the illusion of the self-evidence of axioms and of axiomatic theories mirroring reality and hence expressing an undeniable truth was recognized. Indeed mathematicians showed

* The proof of Proposition IV, in Book I, includes moving about and superposing geometric shapes. As it is one of the earliest conclusions presented and the entire scheme consists of statements based on previous ones, from an axiomatic-deductive perspective, it fails to come up to expectations. To resolve the issue, some of what he presents as deductions have to be added as axioms. However these are not all that self-evident since they require physical manipulation to convince oneself of their validity.

the existence of several geometries, which one applies depending on our perspective. Descartes had warned that mathematics had no objective value, but Galileo's vision of mathematics as part of external nature had become ensconced with the growing closeness between industry and science founded on precise measurements in the physical sciences, and with the changeover from a merchant to a financial capitalism fully reliant on mathematics. Kelvin, typical of a scientist of the industrial revolution reduced science to quantitative science: "when you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, ... you have scarcely ... advanced to the stage of science."[21] So the implications of the changing perception stemming from mathematics, that what mattered was the quality of the scientific study mathematical models are built upon, were not properly identified. For instance, Kelvin and other thermodynamicists led a virulent campaign against Darwin and the geologists by contriving mathematical models to estimate the age of the earth without allowing for geological evidence and oversimplifying physical ones. Their results comforted their religious beliefs, but had deleterious consequences. A former assistant of Kelvin's, John Perry, corrected one of these models by satisfactorily taking into account the molten characteristic of the earth's interior; his estimates agree with current ones. But such was Kelvin's authority that the age-old admonition of natural philosophers, insisted upon by Galileo, to always doubt former scientific statements and verify them for oneself, was ignored and Perry's work was not paid any attention. According to some present geologists, this delayed by nearly a century the renunciation of the belief in an immobile landmass, which in turn has held us back from properly assessing, let alone predicting, seismic activity. Insistence on mathematization rather than on reproducible observation has also served to claim that economics is a scientific subject, and thus to comfort and spread the belief that, to quote Leo Tolstoy, "the laws by which the wealth of Europe had been developed, and was developing, were universal and unvarying",[22] thereby

concealing their dependence on European specificities, and justifying their global enforcement.

In the same vein, based on spurious data, while ignoring multiple counterexamples, the Darwinian-Malthusian thesis of the survival of the fittest created the illusion that the British ideal of the competitive struggle for life of man against man was a law of nature and thereby had universal validity not just for British society, but for all societies: a transfer from Britain to flora and fauna, and then back to the human sphere, this time to the human sphere in its entirety. This perspective on nature, unsupported with sufficient data, focuses on superficial observation and not only ignores the mass of data evidencing cooperation and mutual aid and the minimality of aggression in the animal and plant sphere – a well-fed tiger is unlikely to pursue its usual prey, to kill for the sake of pleasure and surplus–, but it also illustrates another characteristic of European science, namely materialism, which considers reality as a Euclidean space made up of entities occupying a precisely delimitated space, with breadth, volume and so on. This perspective on reality also stems from Church-Christianity, but diverges fundamentally from it in its conclusions. Christian doctrines resolve the problem of ethics, and so of the existence of free will, by considering the human mind beyond reality. However, the science developed in this context gets entangled in issues since, having to dwell in reality, it has to be fully materialistic.

The complexity of inter-dependence need not be totally ignored, but it can only be explained as a complexity of forces, from physical to bio-chemical ones. In particular, consciousness is regarded as a bio-physical phenomenon. Therefore, materialism justifies the transfer of results concerning the inanimate world and the methods used to obtain them to the living one, or those concerning fauna and flora to the human one. This is not to say that a non-materialist view is necessarily correct, but both materialism and its denial are assumptions, except that the former one is reductive and is unlikely to promote the long term survival of our species, or at least of human

civilizations. Note that some of the earliest philosophies to have resulted in systematic scientific developments, notably the Vaiseshika or the Sankhya schools,* also conceived of reality as substance-based and developed dualist visions, where the Mind or Consciousness are clearly differentiated from Matter, but included both among substances.

Materialism provided a congenial environment for another characteristic of early modern European science. Church-Christianity as already stated is founded on the notion of miracles, namely of non-causal events, accomplishable through an all-powerful divine agency. Hence, once causality was reintroduced as the basic principle governing nature, within the framework of a materialist ontology, this belief, which disempowers man, resulted in determinism, and thus in a mechanistic outlook. It too gained support from the Aristotelian tradition and Newton tried to give it scientific respectability. This is what has been remembered of him, not his hesitations. Determinism did indeed become entrenched following the success of his physics. Consequently, the principles enunciated by science were ascribed the status of immutable laws regulating the gigantic clockwork that nature is. In particular this entails that nature can be explained by its parts. Note that, in comparison, Galileo was very wary of generalized statements and insisted on remaining close to data. In this respect, he was nearer his Indian predecessors, but subsequent generations have remembered his mathematization, not his prudence. In the eighteenth century mathematician and physicist Pierre de Laplace gave voice to the widespread conviction that knowing the full state of the universe at a given instant is knowing its state at all times. Yet, the very simple example of a particle moving without friction along a bounded straight line, formulated by Born, but constructible by anyone with elementary knowledge of

* Indian Schools of thought. The former was founded on the work of Kanada Kashyapa and the latter on that of Kapila. Both lived sometime between 900-600 B.C., although in the case of Kapila, this estimation is more controversial. Modern physics followed from the achievements of the Vaiseshika school, and modern medicine owes much to the Sankhya school.

differentiation and of Newton's definition of velocity,* shows that due to unavoidable initial measurement inaccuracies, beyond a certain point in time, as far as we are concerned, the particle could be anywhere on the line. Bettering measuring instruments reduces the initial inaccuracy, but it can never be eliminated. Hence all we can do is expand the time interval within which prediction is possible, but it will always be limited. This example concerns an ideal system. In reality, there are many factors involved, friction for instance. Therefore, our ability to know what happens beyond a certain time interval is limited in ways that no amount of technical progress can overcome because of chaotic behaviour.

Alongside, Europe's Aristotelian tradition resulted in attempts to isolate pure reason from the complex process of cognition. Every single civilization's philosophical, scientific and technological achievements have followed from the exploitation of our capacity to reason, yet none have felt the need to highlight the obvious because at no point have they had to define themselves against a commonsense defying backdrop of the type described above, and so have not denied the validity of other more intuitive paths towards knowledge of the basic mysteries of life. In Europe, on the one hand, within a context geared towards establishing Church doctrines on solid grounds, the multiplicity of logical systems was not perceived, and a priori convictions dressed up in the garb of logic became regarded as self-evident truths; on the other, rationalism emerged so to speak as the banner of modern European thought in opposition to Church-Christianity. Hence, although the later empiricism of European philosophies and science runs counter to this insistence on a priori rational knowledge, until the last century rationalism remained viewed as a characteristic of this science, to the point that Kant had to resort to an exceptionally difficult logical reasoning in

* Suppose its initial state is given by the point $x0$ and its initial velocity is $v0$ and the inaccuracy in our original measurements amounts to $\Delta x0$ and $\Delta v0$. According to Newton's first law, at time t, its position should be $x = x0+tv0$. However, our prediction of its position at time t will deviate from this value by $\Delta x = \Delta x0 + t\Delta v0$. So, our error will keep increasing with time. At times $t > tc = l/\Delta v0$, this deviation will be greater than the length l of the line, and hence its position will no longer be predictable.

his attempt to re-establish the age-old conclusion that reason cannot "penetrate" the transcendental sphere,[3] if such a sphere exists, and thus that any intuitive conclusion about it must remain a personal conviction.

The completely new conviction to emerge in clear opposition to Church Christianity, namely to Christianity's belief in a downfall from an earlier Eden due to man's sinfulness, is the belief in linear progress, or at least overall progress. As is usual with dogma, namely any certitude about reality uncorroborated by evidence, the outcome has been confusion. Is it progress in knowledge, in ethics, or material progress? All too often, writings tend to suggest the latter, intimating that science should be at the service of technology – a view that had become established by the time of the industrial revolution. Charles Darwin, influenced by this dogma, characterized natural selection as a mechanism that "works solely by and for the good of each being, [and so] all corporeal and mental endowments will tend to progress towards perfection".[23] As to how to attain perfection he indicated it was through the accumulation of capital: "through accumulation of capital civilised races have extended and are now everywhere extending their range, so as to take the place of the lower races."[24] In other words, perfection consists in the successful pursuit of profit maximization; this is what civilization tends towards, and Europe embodies this perfection. Science has since then realized that evolutionary processes have nothing to do with perfection, but evolutionary theories a la Darwin and European expansion served to convince Europeans of the validity of the doctrine of progress and connect it with their changing fortunes.

Since the early twentieth century, these convictions have been undermined by European science itself. Yet they continue to hold strong in many quarters. Belief in the objectivity of reality, and hence of science, has been called into question, to begin with by the theory of relativity. However, the search for external truth, a fortiori objective, in opposition to internal subjective truth, had by then become part and parcel of the fabric of European scientific thinking, so much so that, as confessed by Max Born, one of the most reflective and outstanding physicists in recent history, the conviction that science's

aim is 'Truth' continued to hold strong. It is in the mid-1930s that this conviction begun to erode among some scientists as a consequence of quantum mechanics and developments in logic. It is now receiving its final blow from biology. This said, writings about science by historians and philosophers remain equivocal: in his discussion of the definition of science, Sir Geoffrey Lloyd[25] seems to assume without questioning that science "must deliver truth". Scientific theories continue to be "treated as objective facts" and "universal truth"[11] continues to be ascribed to them, although these fallacies were pointed out by Carpenter nearly 150 years ago.

The reverence for mathematics has increased in recent times. The term 'descriptive' has acquired a pejorative meaning in science, notwithstanding the remarkable successes of a more descriptive approach, notably Darwin's establishment of biological evolution, a veritable monument to science, or Mendeleev's classification of elements, on which modern chemistry and atomic physics are founded, or Wegener's substantiation of continental drift. Ecological practices continue to be ridden with measurements, without taking into consideration the consequences of the act of measurement on the observed animal, and forgetting that just like mere description is not science, neither is mere quantification.

Given that over-mathematization and materialism go hand in hand since mathematics standardizes and erases individual differences, it is not surprising that, all too often materialism is still considered a standard criteria of science, rather than a specific feature of early European science. That it is only an assumption is forgotten, hindering a proper analysis of its validity, and participating in its transformation into an objective feature of reality. The consequences can be tremendous. It can make science waste time with less probable scenarios by raising wrong questions and hiding the assumptions being inadvertently made. For instance, regarding the early history of our planet's atmosphere, the first serious conjecture about its nature was articulated within the framework of abiogenesis, a hypothesis meeting the criterion of materialism. This oriented research towards investigating whether the basic organic elements can emerge in an inorganic atmosphere, and this was seen to be the

case in the 1950s. It has taken us more than eighty years to actually empirically examine whether our primeval conditions were indeed inorganic. A 2011 study has revealed they were not quite so.[26]

As for determinism, it began to be undermined by the need to introduce statistics into physics. However, instead of analyzing dispassionately its implications, within an economic context requiring the perpetuation of the illusion of determinism the bulk of the intelligentsia, both within and outside science, continued to cling to it and to popularize it. Hilbert's vision of mathematics as a corpus of results following mechanically from a few premises falls within this context. Mill reiterated Laplace's conviction: unlike the Nyaya school,* he failed to realize the criticality of immediacy in a causal analysis. In the twentieth century, our evolving scientific understanding further undermined and limited the scope of a deterministic view. Nonetheless, it continues to hold sway in current discourses purporting to be scientific, resulting in contradictions between scientific determinism and the existence of free will.

Rationalism too continues to be regarded as typical of European science. To quote the late historian of science Rupert Hall, "Rational science... by whose methods alone the phenomena of nature may be rightly understood, and by whose application alone they may be controlled, is the creation of the seventeenth and eighteenth centuries."[27] In other words, it serves to dispute the scientific nature of the science of other civilizations and reduce them to mere empirical sense-perceptions. Following Joseph Needham, these are still regularly labeled "pseudo-science". Even thinkers like Heinrich Zimmer, who in the last century began recognizing the importance of Eastern thought, have relegated it into the transcendental sphere, while insisting on the logic and rationality of Western thought. Consequently, the rationality within Eastern thought, which its proponents have insisted upon from time immemorial, and the irrationality within Western thought, have not been properly analyzed.

Yet, mathematics, science and logic, especially since the last century,

* Indian school of Philosophy: said to have been founded by sage Aksapada, also known as Gautama, probably around 550 B.C., author of the Nyaya Sutras, the etymological meaning of 'nyaya' being logic; the school became associated with the Vaiseshika school.

have distanced themselves from a reductive and rigid rationalism, as evidenced by the new definition of science by the British Science Council. Notably, according to quantum mechanics, two contradictory features can co-exist, which takes us into the realm of the harmony of extremes of Chinese philosophies, away from the reductive second order logic on which Aristotle built his entire rationalist ontology. But these implications have yet to find their way outside some scientific and philosophical circles. Second order logic unsuited to human situations is still used to determine policy. Interestingly, although 4- and 6-valued logic were elaborated in ancient India, and major progress has been made in multivalued logic since the last century, neither in the past nor today has there been any systematic attempt to build a mathematics based on higher order logic. This problem is certainly most challenging, but such a mathematics would be better suited to express the uncertainty inherent to science than a second order framework where a statement can only be true or false. It would not supersede probability, but provide a much needed alternative to a subject whose foundations are all too fragile.

2.3 Consequences

Now, if all is inevitable, and inevitably progresses, then ethics loses meaning. In Asia, a rigorous analysis of nature and thus science had on the whole been regarded as the means to learn from nature or the external world, a means towards ethical and spiritual transformation, but a means subservient to the path of inner knowledge. That ethics should be based on a study of nature was reasserted in the sixteenth century by Giordano Bruno, while Galileo insisted that religion be compatible with such a study. By the eighteenth century, the emphasis had further shifted away from inner knowledge to science as the path towards ethical betterment. For French philosophers, as set out in their Encyclopedia, the sciences "have taught us the duties of mankind".[28] As for the converse, the dependence of science on ethics and spiritual values, implicit in Asian traditions, where an individual's thoughts and actions are regarded as reflecting his values, it has been increasingly obscured.

Indeed, the connection between science and ethics was abandoned

by the time of the industrial revolution. Poincaré became the voice of this radical shift, mainly in reaction to Tolstoy's impassioned criticisms. Without answering the latter's veritable contention that the removal of ethics from science is part of a more general process of distortion of science into what Tolstoy called "false science",[29] he declared: "There can no more be immoral science than there can be scientific morals".[30] He did recognize the need to select a research topic among numerous ones, and as already remarked, the inevitability of selecting a few data, and did admit that the former involves ethics. Yet, in line with the belief that choice is purely dictated by objective rational scientific factors, he strongly believed in "science for its own sake",*[30] which conceals the dependence of this choice on subjective ones, notably socio-cultural factors. His statements notably obscure the imperative necessity to let observation take us beyond our prejudices, our cherished convictions, by specifically searching for evidence against those very convictions. Only then can our conclusions be called scientific: the choice is mainly between remaining on a scientific path or deviating from it while claiming allegiance to science. Poincarī justified his stand by alleging that the quest for "intellectual beauty" has given Europe "the empire" and is the reason why it "dominates the world" and had earlier enabled the Greeks to "triumph over barbarians"[30]: others could not go beyond the realm of the senses. So determined was Poincarī to eliminate ethics from science, that he was unfortunately left with no recourse but to appeal to the grotesque and legitimize man's search for and need of beauty by man's most bestial instincts.

The elimination of ethics is closely related to the economic perspective that emerged from the pursuit of unlimited profit. In particular, this perspective entails the necessity of constant growth and thus expansion, and this globalization process has been at work since the fourth century. First the Christian worldview was used to bring non-Christian populations to co-opt. Forcing them to do so was justified by the peculiar form it gives to the concept of universalism, namely a universalism that does not admit pluralism.

* Not to be confused with "work for work's sake" whose meaning lies in detachment from the fruits of work while engaged in some work.

But Church-Christianity clearly had limits: enforcing it on Asia and the Islamic world was a different matter from enforcing it on more defenseless peoples. By the time religion was being replaced by secularism, conviction in this form of universalism had become so entrenched that, despite the rise of science, which like Jesus' teachings has unparalleled ethical implications for collective society, other cultures were regarded and judged by the criteria of European culture. In other words, European thinkers on the whole did not view their culture as a particular reflection of an underlying universality, and other cultures as other particular reflections, but considered their own as the standard, universal, measuring rod. This is especially the case regarding its science, the foundation stone of modern Europe.Therefore, the far more powerful vehicle of dogmas in the name of an exclusively rational European science cloaked in the garb of objectivity and inevitability, of self-evident principles leading to universal truths and incessant progress, has been put to use to, on the one hand, abort any attempts in its own land to restore a veritable diversity of thought, and on the other to vindicate the righteousness of expansionist policies, as well as shame non-Europeans into voluntarily abandoning their past with the unique option of adopting a Eurocentric perspective.

Note that in late nineteenth century and early twentieth Russia, within the only alternative scientific vision to have to some extent survived, which insists on the ethical foundation of science, while scientists laid bare the flaws of the Malthusian hypothesis, some thinkers promptly identified and exposed the transformation of science into dogma.

3 Scientism

Now, these misconceptions together with the weaknesses inherent to a scientific approach laid the ground for the distortion of science. Science is bound to indicate the impact of our actions once this impact has become detectable by existing means. By its very nature, it takes us from unrealistic theories to less unrealistic ones since at any given time these must conform to data obtainable at the time. Thus it warns us when we are definitely wrong, namely when the

gap between our theories and reality becomes too significant, in particular when our technical applications will generate alterations to natural conditions resulting in too much disorder. Now, according to our scientific understanding, human life will continue only as long as these conditions are not inordinately altered. So, a socio-economic system can no longer be sustained or justified by science once it generates inordinate alterations. Since a system whose motto is profit maximization demands incessant and increasing material growth, the result is incessant and increasing alterations to these conditions. To maintain such a course, we have reached a point where we must rely on research that refutes the nature of science.

This highlights a major difference between science on the one hand, mathematics and technology on the other. Mathematics is a means of expressing quantifiable patterns, but these patterns need not aim to be compatible with observation. Likewise, technologies depend on our purpose. As with mathematics, the use we make of them, the shape their development takes is determined by our values, and these values need not be compatible with conditions congenial for our species' survival. In contrast, although the form and orientation science takes depends on our values, science suggests what these values should be if we do not wish to bring humanity to a premature end.

The ultimate stage, the actual establishment of scientism, the dogma science has be distorted into, took place in the last half century. Like any faith it consists of beliefs in the unverifiable and of beliefs incompatible with observation. It notably claims to answer questions about the origin and essence of life, nature and the universe. Remarkable scientists have fallen in this pitfall. For example, the late Stephen Hawking held that "[b]ecause there is a law of gravity, the universe can and will create itself out of nothing",[31] thereby forgetting that the whole is beyond observation. The assertions of scientism are made in the name of science, but, to use Tolstoy's words, the very "scientific method" it claims to uphold, in other words, "common sense exposes it at every step."[32] According to him its pretension to know life from the study of its parts is "explicable only by the fanaticism of superstition".[33]

The parallels between scientism and Church-Christianity are striking. Both allege to be "in command of such methods that the data obtained is indisputably true",[34] to be universally valid and that all other belief systems are false. Since they are convinced of being exclusive possessors of truth, they do not hesitate to enforce this truth whenever necessary. This has now reached a dangerous level imperilling mankind. For although scientists of the past, or for that matter some of today like Hawking, have merely displayed a common human flaw of giving precedence to dogmatic beliefs, without any desire to mislead the public, like Church-Christianity before it, scientism has more and more recourse to sophisticated methods to elaborate falsehoods and distort science in order to serve an economic ideal based on profit maximization.

The situation has now reached such depths that some from within the establishment are speaking out. To quote Richard Horton, the editor-in-chief of the Lancet, "The case against science is straightforward: much of the scientific literature, perhaps half, may simply be untrue. Afflicted by studies with small sample sizes, tiny effects, invalid exploratory analyses, and flagrant conflicts of interest, together with an obsession for pursuing fashionable trends of dubious importance, science has taken a turn towards darkness."[35]

Indeed, lying in the name of truth has now been refined into a most insidious tool. Scientism does this much more convincingly than Church-Christianity. Hypotheses given the allure of bona fide theories in the name of scientific 'truth' are far harder to deconstruct than falsehoods in the name of a spiritual teaching, witnesses of which have long disappeared. Every means is game. To begin with, language is put to contribution: expressions belonging to mathematics such as 'science shows' or 'proves', hide its veritable nature, that it does not consist of immutable facts and objective truth, that on the contrary it brandishes its inability to know truth as its essence.

In the worst cases, evidence is invented outright or none given. Unfortunately this is becoming increasingly frequent when large sums of money are at stake. Or else, and this is commonly done, conclusions are said to be of a far more general scope than warranted by the data. The greater the distance between claims and data, the

more they must rely on assumptions, thus the more they become akin to dogma, and the more they infringe on religion. When a hypothesis is based on partial data, all too often contrary data is discarded or when known is concealed. Using competition or security as an excuse, the data used is not communicated to the scientific community – thereby contravening a main characteristic of science: transparency. When contrary data are not yet known, one way of making sure it remains so is not to look for these. There are several ways to achieve this. Notably, observation can be kept superficial and the obvious questions suggested by known data ignored. For instance, a striking common point in health damaging manmade reproductions of natural phenomena is that they are far from being replicates of their natural counterparts. Common sense would suggest the assessment of the consequences of these differences. However, it is only in 2015 that the first such study was conducted in the particular case of electromagnetic waves. And indeed it found that the dissimilarities between artificial and natural ones were the cause of the former's impact on health. Basically, all planes of propagation of natural electromagnetic waves are equally likely; they are said to be unpolarized. In contrast manmade ones are polarized; they are restricted to certain directions. This is why they "force all charged/polar molecules and especially free ions within and around all living cells to oscillate on parallel planes and in phase with the applied polarized field ... resulting in their disruption of the cell's electrochemical balance."[36]

Another way of making sure of the absence of contrary data is to focus on an implication while leaving its converse unassessed. This is closely related to oversimplification and a flawed causal analysis; it gives the impression of equivalence where there is none. The approach to genetic diseases provides a good illustration. Until recently, all that had been checked was that certain diseases only occur if a certain mutated gene is present. The converse implication was not addressed before 2016, when a study was conducted to identify healthy resilient individuals carrying the mutated gene instead of focussing on afflicted ones as had been the case so far. In other words, until recently, carrying a gene connected to a disease

was assumed to be a sufficient reason for the likelihood of contracting the disease, without verifying whether the mutated genes are only harmful in certain conditions. Now, if this is found to be the case, it might reduce the profits of the billion dollar business that genetics has become.

When statements are not sufficiently substantiated by observation, logical incoherence follows: the notion that one type of cholesterol is good and the other bad contradicts Darwinian theories that evolution is a matter of a natural selection of the traits more adapted to our environment. As for Hawking, he "presuppos[es] the existence of the universe in order to account for its existence", which to keep quoting mathematician John Lennox, is "self-contradictory".[37] The absence of any logic can leave no alternative but recourse to the grotesque, as illustrated by Poincarī's statements, and even more so by the development of eugenics from Darwin's unscientific Malthusian dogma. The summum bonum of all nauseating grotesqueness, the latter took Darwin himself down unsavoury paths: in 1871, he wrote that we "must ... bear the undoubtedly bad effects of the weak surviving and propagating their kind".[38] Not once did it occur to him, as it did to his contemporary, zoologist Petr Kropotkin, that it is the "thousands of weak-bodied and infirm poets, scientists, inventors, and reformers, together with other thousands of so-called 'fools' and 'weak-minded enthusiasts' ... [who are] the most precious weapons used by humanity in its struggle for existence by intellectual and moral arms".[39]

As a result, like the Bible, within a growing context of conflicts of interest, mutually referenced articles in prestigious journals create their own narrative. Contrary arguments are less likely to appear and be cited. If articles at odds with the doctrines of scientism are published, they are stalked. Every such article is systematically followed by a counter one aimed solely at discrediting it. This is not difficult since it is likely to reference other articles from less prestigious journals, and since scientific theories by their very nature present weaknesses. Like heretics in the past, their authors are disparaged and decried in the name of science. Today's Brunos are

burnt at the stake of humiliation on the public place of the scientific or the greater community, deprived of the means to reach an audience through their writings or to continue their work. The impact on their careers can be critical – from being relegated to dingy offices with little access to the necessary scientific infrastructure to putting an end to their research funding, possibly even to their salary and their job where this is legally possible. For the sake of a peaceful life, regular pay and a smooth career, or because of the temptation of honours, or simply because of a genuine belief that the dogma learnt is science, most, passively or actively, opt not to disturb the status quo or go beyond safe domains. Mathematician Grigori Perelman's comments apply beyond mathematics: "Of course, there are many mathematicians who are more or less honest. But almost all of them are conformists. They are more or less honest, but they tolerate those who are not honest."[40]

4 Salvation Through Science

Containing scientism is the only way to veritably regain a world suited for human beings, a world where we need not incessantly worry about our mere survival. Taking each issue one by one is not sufficient. Once one is disposed off, like the many-headed hydra, several new ones appear in its place. Only by depriving our self-created hydra of its vital supply provided by scientism can it finally be asphyxiated. To do so it is essential to distinguish science from the distorted faith claiming to speak in its name. The latter's edicts are shrouded in the symbolism of mathematics, mathematics having replaced Latin as the language of the Cognoscente. Thereby, the simple is made to look complicated and the absence of solid foundations for a theory is obscured. Comprehending what science is is merely regaining our commonsense. Science can be subverted into what it is not, but this in no way affects what science is. "Science", as written by Leo Tolstoy, one of the earliest to have analyzed its transformation into dogma, is "as necessary to man as food, drink and clothing – even more so – but ... [it] become[s] so not because we decide that what we call science ... [is] essential, but because science ... [is] really essential."[41] It is essential in more ways than one.

For all its shortcomings, as its nature suggests, a scientific approach is the only one that can provide us with a picture in any degree reliable of the reality we physically live in because it combines empirical data with reasoning, and is of the realm, if not of the verifiable, of the refutable, and is thus an approach with an in-built self-correcting mechanism. Every other path is inevitably one of faith, even rational paths devoid of observational support. This does not mean these paths are not equally essential, but regarding the realm investigable scientifically, their greater subjectivity makes them a far less dependable guide.

In particular, by its very nature, a scientific approach entails recognizing the complexity of nature, and taking better account of it. As illustrated by some of Maurits Escher's pictures, when different motifs are intertwined, our brain's analogical thinking can only observe one at a time. Hence it is critical that a question be studied from multiple angles since no single perspective can possibly shed full light on an issue. Partisanship can be avoided by applying geologist T.C. Chamberlin's "method of multiple working hypotheses".[42] The untoward influence of the assumption of materialism highlights the importance of his suggestion. His method should be extended beyond the confines of any given type of science. Indeed, each type is founded on a-priori assumptions, and hence limited by these assumptions. Therefore, just like a theory within a given scientific tradition, any given scientific tradition projects a light on reality from a given perspective; so critical aspects might go unnoticed. Once the achievements of every scientific school is reassessed, Chamberlin's method will facilitate our recognition and examination of assumptions become all too familiar. Obviously giving credence to different views entails giving assumptions contrary to our cherished convictions due regard and recognizing our own assumptions for what they are. In short it entails proceeding scientifically and not asserting empirically unsupported claims as conclusions.

The purpose is to reach a constructive synthesis. Otherwise, we might progressively get lost in small by-ways, and no-throughways.

To quote physicist Werner Heisenberg: "It is probably true quite generally that in the history of human thinking the most fruitful developments frequently take place at those points where two different lines of thought meet. These lines may have their roots in quite different parts of human nature, in different times or different cultural environments or different religious traditions: hence if they actually meet, that is, if they are at least so much related to each other that a real interaction can take place, then one may hope that new and interesting developments may follow."[43] This is how European science developed in the very first place: by giving its own colouring to concepts coming from widely different cultures, and which from the oldest times, had been polished and re-polished from varying perspectives. As a result of the in-built self-correcting mechanism within science, European science is now taking us beyond its rigid initial rationality and logic. This demands a re-evaluation of some philosophies, notably from the East, that have resolved the resulting issues in their own ways. They can serve as inspiration for the creation of a new framework to approach scientific questions through their adaptation to our current state of understanding.

Rejecting science would also be regrettable because, as insisted upon by Tolstoy, personal ethics and spiritual concerns need to be "in accordance with reason and knowledge"[44] insofar as their projections onto our common sphere should not be incompatible with conditions necessary for human life. And science is our best indicator of behaviour likely to bring about modifications to the biosphere harmful for our continuation. In particular, as already remarked, it warns us to refrain from excesses that bring too much alterations to the conditions of life. It goes further, it suggests that our collective ethics should be based on a harmonious co-existence. Science itself is a harmony of contraries: observation keeps flights of fancies in check, while it is not possible to observe outside of a theoretical framework; it consists of team work over time and space, yet the individual mind plays a central role. Science does not stop there. According to our current understanding, both natural and socio-cultural diversity is essential: we depend on the former for our physical survival, and on the latter for the survival of what

characterizes us as human beings, the human mind. Thus science agrees with the basic message propounded by sages throughout history, namely with the basic longing of humanity everywhere. This longing in Europe has been made part and parcel of the very fabric of its orchestral music, a sublime harmony rather than cacophony resulting from apparently disparate instruments playing their own tune, a harmony in which both the triangle and the violin have their place, both are critical, and both must hold their own without flinching, but in coordination with all others, never ceasing to listen to them, under the guidance of a leader able to hear and single out every strand and blend them in a harmonic whole.

It is up to us whether we continue to hold on to dogmas that have established a virtual reality incompatible with reality, further losing any sense of reality, or whether we heed the warnings of science, and thereby shape our technologies and mathematics according to the values suggested by science, and thereby give ourselves the possibility to let our full humanity unfold in a magnified consciousness of the unity underlying our essential diversity, the possibility to saunter along our scientific pathway in an appeased manner, attempting to understand, searching but never finding, every time 'the' truth that seems within reach, fading away, every time having to settle for less; wisely proclaiming like Socrates that we know that we know nothing, that what we feel we know today might be proved wrong tomorrow, yet proudly persevering, incessantly hoping. Science is the realization of this most profoundly human truth: Truth with a big T cannot be known, it is beyond description, it is beyond words, it can only be experienced.

Notes

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"NEEDHAM OF INDIA" AND HIS COMMUNICATION WITH MEGHNAD SAHA*

ATRI MUKHOPADHYAY

The correspondence between Samarendra Nath Sen and Meghnad Saha, while the former was in Paris on a UNESCO project, is reviewed. It transpires that the experience Sen gathered from this work and the various errands run by him in Europe for Meghnad Saha indirectly helped him become a science historian in later years. At the end is recounted Sen's overall achievements.

I

Samarendra Nath Sen, best known for his book, *bijnaner itihas* (*History of Science* in bengali), exchanged a number of letters with his guru, Professor Meghnad Saha, particularly when working for the Natural Science Section of the United Nations Education, Scientific and Cultural Organization (UNESCO) in Paris from July 1947 to June 1949. The Meghnad Saha Archives (MSA) of the Saha Institute of Nuclear Physics, Kolkata has about 18 letters written by him and as many by Professor Saha mostly during this period. The lot, having no explicit bearing on Sen's becoming, in later years, a science historian, is nonetheless important in the sense that it reveals the kind of tutelage he then received under his guru Meghnad Saha through running various scholarly errands for him in Paris.

As Sen writes in the preface of *bijnaner itihas*, a project was then undertaken under the auspices of the UNESCO to prepare a cultural history of mankind. Specialists were involved to see to it that the scientific activity and contributions of various nations were amply covered. Sen's job was to spread awareness, among people, of the relevance of science in the society and in international field. While on it, Sen had the occasion of interacting with many scholars in the field and consulting many rare documents.

Back in 1945-46, Sen was initiated into an allied job by Meghnad

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Saha. The International Council of World Affairs then organized a discussion among the representatives of the various Asian countries on the contribution of the East in the field of education, science and culture. While writing, for the Council, an article on the cultivation of science in Asia, Saha, by greatly involving Sen, had instilled in him a keen interest in history of science. Sen's stint at UNESCO only furthered the effect.

II

Sen was born on 28 February 1918 (though the *Indian Journal of History of Science — IJHS —* in the obituary notice records the date as 1 October, 1918). His birth centenary year coincides with the 125th birth anniversary year of Professor Meghnad Saha.

Sen did his B Sc with honours in Physics from Vidyasagar College, Kolkata in 1938, and M Sc from the University of Calcutta in 1940, ranking, in the latter, first in order of merit and winning the University Gold Medal. He was a favourite student of Saha, who had just returned from Allahabad in 1938 as the Palit Professor of Physics. Naturally enough, one expected Sen to pursue a career in scientific research after this, but for some reason, he opted for a lectureship in Physics in Scottish Church College in 1941. He was there until 1947, when the Indian Association for the Cultivation of Science (IACS, referred hereafter simply as the Association), Kolkata appointed him Registrar. Saha was then the President of the Association, and Prof Priyada Ranjan Ray, the honorary Director. Soon after joining the Association, Sen left for Paris on a UNESCO assignment. With Sir Joseph Needham the Director of the Natural Science Division of the Organization, this could very well be in response to his urgent request for a suitable man, placed with Saha. Saha had met Needham in the summer of 1945 while visiting the-then Soviet Russia. It may appear a little premature for Sen to have been granted a leave of absence for six months (July – December, 1947), but our guess is, Saha exercised his influence on the Association in favour of Sen, as also on Ripon College to release, on lien, Mr RM Roy for acting as the officiating Registrar of the Association in Sen's absence. By then, Sen was married to Kanika. However, he left alone for Paris.

III

Towards the end of 1947, Saha was invited to the 10th Rutherford Death Anniversary Conference in Paris organized by the French Academy. It was a two-day conference beginning on 7 November. Saha reached Paris the day before, and Sen must have received him. Saha had a packed programme this time. He was a member of the Atomic Research Committee of India since its formation towards the end of 1945 and restructuring, in 1947, as the Board of Research in Atomic Energy (BRAE) under the control of the Council of Scientific and Industrial Research (CSIR) headed by SS Bhatnagar. The Board was presently chaired by Homi Jehangir Bhabha (who also attended the same Paris conference). Regarding the Indian Atomic Energy Programme, Saha differed with Bhabha on many issues. In order to reinforce his stand he wanted to visit many places in Europe and collect information about the scientific organizations there related to atomic energy and compile a report.

In Paris, he saw Prof F Joliot-Curie regarding the French Atomic Energy Programme. Apparently, he introduced Sen to him about this time. Prof Joliot promised to supply more information through Sen. Despite the busy schedule, Saha found the time to meet Needham again, with Sen accompanying him. It was more than a courtesy call. Together with others, Saha had been publishing since 1935 a journal called *Science and Culture* from Kolkata with which Sen was also intimately associated. Running such a journal was a costly affair. Saha knew, UNESCO often funded such publications. On Needham's suggestion, he filed an application for a UNESCO grant of $15,000 for the Indian Science News Association (ISNA) publishing the journal. He was given to understand that getting the money would be no problem, but a formal approval had to be obtained at the Working Party meeting, to be held shortly.

Saha spent about a month in Europe on his mission and left it to Sen to collect more information on the scientific organizations in Europe. Leaving England on 7 December, he was back in Kolkata on the 9th. His correspondence with Sen began thereafter. Always addressing Saha as "My dear Professor" in his letters to Saha, Sen ran

various errands for him like collecting, compiling and transmitting reports on the scientific organizations in France, and sending him relevant books and journals from time to time. Occasionally, Sen's letters would understandably betray his anxiety over the uncertainty of his present tenure in Paris *vis-a-vis* the sanction from his employer at home of further leave of absence.

IV

Since his return to Kolkata, Saha was anxiously waiting for letters from Sen, but mails were irregular because of the troubles then erupting in France. The condition in India (following the partition and independence of India) was quiet then, though there was some demonstration against the-then Bengal Ministry[1]. Saha assured Sen that a leave of further 6 months has been accorded to him, and there would be no difficulty if Sen wished to prolong his stay there for another year[1]. Furthermore, he wrote that, the Association, then located at 210 Bowbazar Street in North Kolkata, was getting a piece of Government land in Jadavpur, the south suburb of Kolkata, for which the Managing Committee had applied earlier. He asked Sen to buy some books and journals for him and to collect some data on CNRS (finance, administration etc). Inquired if Sen could find the time to contact Prof Joliot-Curie and his collaborators and collect information on the organization of Atomic Research in France. Also wanted to know what was the UNESCO's stand on the grant applied for. On the personal side, he assured Sen that everything was fine at his father-in-law's. It appears that Sen's in-laws were in regular touch with Saha.

Sen spent the Christmas vacation in London. Before leaving Paris, he had already started preparing a report on the science organization in France and sent Saha 5 books. His next letter[2] to Saha carried the devastating news about the UNESCO grants to ISCA. Sen was sorry to report that Prof Bhabha had wrecked the whole scheme by himself declaring, at the working Party's meeting, that the Indian Organizations could well take care of themselves and that they did not need international patronage. Sen had got the full story from Dr Grimmatt of the Natural Science Section, who acted as the Secretary of the National Science Working Party in Mexico City Conference and

Bhabha the Chairman. Sen wrote, when the question of grants-in-aid came up for discussion, Dr Needham rose up to plead for their case; but Prof Bhabha immediately silenced him by saying that *Science and Culture* – and for that matter, any Indian paper – did not require any such financial help. So great was Needham's dismay at such an unexpected opposition from a member of the Indian delegation that Dr Needham had to drop the subject and pass on to other business. Bhabha's attitude also produced a great reaction among Sen's European colleagues, for the matter was openly referred to in one of the weekly staff meetings. Sen felt that such a behaviour, whatever be his reasons, lowered them to a certain extent in foreign estimation.

Saha reacted[3] bitterly to this piece of news. To Sen he wrote, "it was extraordinary behaviour on the part of Dr Bhabha. This shows the extent to which a man can debase himself when actuated by malice. I am bringing this matter to the notice of the Govt of India with the request that they would demand an explanation from Dr Bhabha, but nothing may come of it." He acknowledged receipt of the literature sent by Sen and asked him to collect more and send articles for *Science and Culture*.

Meanwhile on 30 January, Mahatma Gandhi fell to the assassin's bullet. Acknowledging Saha's letter of 22 January, Sen wrote[4] that the news of the tragic death of Mahatmaji was received in Paris as a bolt from the blue. In his words, "it was very hard for us to believe that such a thing could ever happen. Good men and women all over Europe, and perhaps the world, were profoundly sorry at this great tragedy of the humanity. On Friday, at 2 O'clock in the afternoon, the news was first broadcast here by the Radio D' Francaise. All the evening papers of Paris came out with the news on the front page as well as with the editorial tribute to the hallowed memory of the great Man." Sen was anxious to know if *Science and Culture* and the IACS had started receiving copies of *Atomes and La Nature* for which he had paid the subscription. Last week he had sent Saha 11 copies of a new popular science fortnightly *Science et Avenir* (Science and Future), the first issue appearing in June 1947. His X-mas vacation in London was good but he could not access any scientific institutes because they were all closed. At work, he informed, the Directorate by now

announced some drastic changes in their salary and allowance scale which would adversely affect them. Sen also added that Dr Needham was very keen in sending him to Washington for studying the Science Service Organizations and that his trip was budgeted for. It might materialize provided the Executive Board sanctioned the expenditure.

In his reply Saha wrote[5], "The tragic end of Mahatmaji has plunged the whole country in the deepest gloom. Many disturbances are expected and everybody is anxious about the future...there is a great anxiety over the shape of things to come in India". Regarding the Bhabha episode he continued, "We have represented to the Government of India regarding the behaviour of Dr Bhabha formally. I hope they would take some action and demand an explanation from him though I am not very hopeful. We have already submitted our application which was before the UNESCO to the Government of India on account of the misbehaviour of the representative for which we lost a large sum of money". A month later, Saha would write again[6], "Dr Bhabha's behaviour re grant by the UNESCO to the ISNA was brought personally to the notice of Maulana Abul Kalam Azad, MoE, GoI. I saw him personally. Maulana has directed the matter to the Secretary of the Dept., that something should be done as Bhabha was not empowered to make any statement on behalf of the Government of India and cause injury to any party". So the matter was referred to National Institute of Science (NIS, later renamed as Indian National Science Academy, INSA). They recommended a nonrecurring grant of Rs 12,000/- and a recurring grant of Rs 1,00,000/- spread over 3 years. However, it was to go to the Education Dept and Finance Dept of the Government for an approval. The things did not settle until the middle of 1948 when Saha would write to Sen that the Bhabha incident was over. They made an application to the Government of India for giving them a grant. Though recommended by the NIS, it was yet to come[7].

Saha was happy to know that Dr Needham was so much satisfied with Sen's work. He expressed the opinion that Sen should certainly go to America which is now a far better place for learning.[8] Unfortunately, however, Sen's American trip fell through. Sen informed[9] Saha that Dr Needham would be leaving UNESCO in the

middle of April this year and be succeeded by Prof Auger. "We are all so sorry and unhappy about Joseph's leaving UNESCO. It would be difficult to find one who combines his ability with his idealism", he wrote. Prof Auger was well known to Saha[10].

Sen's first 6-month-contract expired on December 31, 1947 and no new contract was drawn yet[11]. The Secretariat would hopefully give them contracts for a longer period (2 to 3 yrs). Dr Needham had asked Sen if he would be willing to accept it. Sen did not know what to do. Apparently, his continuance in UNESCO for three years or so would "no doubt enable him to strengthen" his present poor financial position. But, then, he was afraid of losing his "excellent job in the IACS" and facing an uncertain future at the end of three years. He sought Saha's advise on it.

Here we find Saha a little diplomatic. While glad to know of the possibility of Sen's getting a post under UNESCO for 2-3 years as an appreciation of his work and talents, and whole-heartedly recommending Sen to accept it (subject to his family's approval which Saha had already secured), he wrote[12], Sen should then tender his resignation from the Association. Saha has already consulted Prof P Ray and members of the Council. While they were all glad at Sen's lift in life, they thought if he was away for three years, it would not be fair to the Association to fill the post on temporary basis that long. However, Saha wanted Sen taking the risk, for, this appointment would give him unique facilities for acquainting himself with higher activities of Nations and increasing his qualification and experience. To his mind, it would not be difficult for Sen to get a suitable job afterwards, as the Government of India was expanding its diplomatic and scientific activities, and there was such a terrible dearth of men.

Saha was sorry to learn that Needham has left UNESCO[13], after all, Needham is the creator of it. Asked Sen to write an article for *Science and Culture* dealing with the services of Needham to the UNESCO. He inquired about Sen's going to America, or was he returning in time to his services at the Association?

In the meantime, the possibility of Sen's going to USA fizzled out, for from a recent talk with Needham, Sen came to know that it would not be possible for the UNESCO to give him a long term contract, but

his term might be renewed for another year at the most. Sen was not interested in that lest he lost his job at home. On the other hand, his work in connection with the popularization of the social implication of science was proceeding so well that UNESCO would be most reluctant to lose his service at this stage. So, he asked Saha to please explore the possibility of another extension from 1 July, 1948 to 30 June, 1949.[14] Saha received the letter but could not find the time to reply until writing to Needham[15] about it. Sen's father-in-law also saw him. To Sen Saha wrote, it was rather regrettable that UNESCO could not appoint him for 3 years. Regarding his leave, Saha saw Professor P Ray (who was in receipt of Sen's telegram), but they were very much against giving Sen any further extension of leave; the matter would be finally decided in a full meeting of the Council. Saha was afraid that there was no chance of Sen getting any leave for another year, Sen was either to stay there or immediately return to his duty at the Association. However, he thought Sen should not hesitate to accept the UNESCO appointment. Since his services were very much appreciated there they would extend it on a year to year basis for another 2 years in the least. In Saha's opinion, Sen's position in Paris offered him a unique opportunity of increasing his knowledge and range of experience. Saha went even to the length of suggesting that Sen might also choose to work for a doctorate degree in the University of Paris. However, Saha added the cautionary note that "of course, this should not be interpreted as any responsibility on my part for your decision in resigning the IACS appointment". In view of the fact that it would be difficult to get a man of his experience and ability, Saha was sure that Sen would get a suitable job when his contract with the UNESCO terminated.[15] It may appear strange that even in the difficult situation that Sen was in, Saha wanted him to explore what further work was being done by the AEC of France and if he had met Saha's friend Dr Challonge. He assured Sen that the Association was receiving the French journals.

V

While Sen was anxiously awaiting Saha's reply to his letter of 4 April, on 19 April, 1948, UNESCO offered him a contract for one year, whereupon Sen dispatched a cable to the honorary director of the

Association praying for an extension of leave.[16] He was deferring signing of the contract until he heard from him or Saha. On the other hand, UNESCO was pressing Sen hard for a decision. In case Sen decided to leave, he was to give about 60 days' notice to the UNESCO and arrange for passage, which might defer his joining the Association to the end of July. Sen only hoped it would be all right. As he was writing this letter, RM Roy, the officiating Registrar of the Association intimated to him that his case has been referred to the Council.

At home, Saha, however, was trying his best for Sen. He circulated Sen's request among the Council members. Even Dr S Radhakrishnan (whom Sen had met in Paris) had made a request on Sen's behalf. But most of the Council members were against granting him an extension. Saha reiterated[17] that Sen should resign from the Association and accept the UNESCO offer. He was sure, they would extend the contract for another year and Sen would get a suitable job afterwards.

In a letter written from Bombay, Saha had requested Sen to visit the French Govt Radio Factory at Surennes in the suburbs of Paris where they manufactured radio components and to compile data on the details of this organization, administration, personnel employed, capital and total turnover of goods. Saha would acknowledge this help at the Government quarter. By then he had received the UNESCO papers sent by Sen. He asked Sen if they could be published in *Science and Culture.* Saha also apprised Sen that Sir JC Ghosh was now the DG of Industry and Supply and he was getting the port folio of Industrial Policy of the Government of India. On receiving Saha's letter of 19 May from Bombay, Sen had already started making enquiry.[18]

Meanwhile, things brightened up for Sen in Kolkata. Saha wrote to Sen[19] hoping that he had already received the telegram from Prof P Ray asking him to postpone his departure. The main difficulty was the refusal on the part of the Ripon College to grant lien to Mr RM Roy, the officiating Registrar of the Association. After receiving Sen's letter, Saha had represented to them that Sen's stay in the UNESCO for another year would be to the advantage of the country as he was doing very good work. They then agreed to grant lien to Roy for another year. So there would be no problem for another year. Saha received Sen's letter depicting the conditions in France regarding

the manufacture of radio parts. He would like to know more on the Compagnie Francaise de Telegraphie Sans Fil (CSF) and other factories. If Sen visited Sweden, he should make inquiries about the organization there.

Meanwhile, Sen's wife Kanika and infant daughter Bubul had safely arrived in Paris with Prof SK (Suniti Kumar ?) Chatterjee[20] and they had found a flat of four rooms including kitchen and bath temporarily for two months. Towards the end of June, Sen had sent Saha his full report on the state of radio-electric industry in France. He wrote, he liked the new cover of *Science and Culture* for July, though poorly printed. He had also sent Saha the report of the annual meeting of the Committee on Science and its Social Relations, of which a note might be published in *Science and Culture.* He hoped, Saha had received the books on nuclear energy which was dispatched early June. Saha appreciated[21] Sen's exhaustive account on Radio-electrical Research and Industry in France. He was planning to publish a booklet in which he would use these with due acknowledgement to Sen. He had heard that the first general assembly of the World Federation of Scientific Workers would be held in Prague for which Saha was asked to nominate a deputy in the meeting of the Federation. He has already intimated to Prof Wooster that he wanted Sen put in that capacity. He was very sorry to learn that Atomic Energy in France was going to be as secretive as elsewhere whereas Prof Joliot-Curie had been willing to help India. He apprehended if it would be possible now. On 12 August 1948, in continuation of his letter of 10 August, Sen[22] enclosed a copy of his letter to Dr JC Ghosh regarding the manufacture of wireless transmitters etc in India. The company (CSF) seemed to think that all this development was due to Sen's effort and his favourable report on their activities and organization. So they were referring important matters such as this to him for his opinion at which Sen felt a little awkward, for he had no official sanction to hold discussions of such important nature with the highest officials of the company with which the government themselves were negotiating. Sen[23] regretted to inform Saha that the office of the DG of UNESCO was opposed on principle to his acting as Saha's deputy at the First General Assembly of the World Federation of Scientific Workers. They

pointed out that such a representation on the part of a member of the International Secretariat might lead to adverse criticism and they advised him against it. So Sen was not going to Prague. Saha would be glad to know that the CSF finally decided to send Dr Boulanger, one of the research engineers of the company's central research station at Rue du Marce, to India. Dr Boulanger would discuss matters with Dr JC Ghosh and other members of his directorate. While sending Vijaya Pranam to Saha, Sen informed[24], during their recent stay in Paris, Nehru and Vijaylaxmi Pandit paid a visit to UNESCO and lunched with the DG, the deputy DG, the Indian members and a few others high in the office of the organization. Last week, the Indian Embassy in Paris threw a tea party in honour of the PM, to which Sen went and met HJ Bhabha, SS Bhatnagar and KS Krishnan, the latter two recognizing him and expressing great interest in his work. Bhabha was yet undecided about joining the Indian delegation to the 3rd General Conference of UNESCO at Beirut. If he could not make it, Krishnan would go instead. Julian Huxley was leaving UNESCO on the expiry of his term at the end this year. Sir Arcot Ramasamy Mudaliar was one of the candidates for the DG who had a fair chance of getting elected. Powell, the head of the Field Science Cooperation Offices of UNESCO, whom Saha had met during his recent trip to the Middle and Far East, was back to Paris. He was profoundly impressed by the good research work that people in Science College were carrying out. Blackett has just written a book *The Military and Political Consequences of Atomic Energy*. The book has already excited great attention. Sen hoped, Saha already had a copy of it. Saha, not hearing from Sen for a long time, asked[25] if he was going to the Conference at Beirut in Lebanon. PN Banerjee, the Vice-Chancellor of Calcutta University would be going there. The letter also carried the bad news that *Science and Culture* did not get any money from the Government of India on account of the recent economic drive. He asked again, (thanks to Bhabha) has the UNESCO finally rejected the application? They were going through hard times. Saha was expecting articles from Sen. He advised him to try for a job in the External Affairs Ministry of the Government of India or its Education Dept. Said, Sen should apply to both with copies posted to Saha. If Sen's service at

UNESCO was extended for a year, it would be difficult to arrange for further leave from IACS.

In a subsequent letter, Sen[26] informed Saha that he travelled to Italy and Switzerland with his family. To his mind, the poverty of the Italians bore a sad contrast with the opulence of the Swiss. He also reported some changes at his work. Dr Julian Huxley retired from the Director Generalship of UNESCO and Dr J Torres Bodet, the Education Minister of Mexico assumed office from January. No sign of a long-term contractual arrangement with the secretarial members. Sen and others' position was as precarious as it was two years before. A whole department – the Exchange of Information – having more than 50 persons was suppressed with effect from the beginning of this year. Many old hands left UNESCO and went back to their positions or try new jobs. So Sen was not keen on trying for a renewal of his contract after June. It looked certain that he was going back to the Association in July. Saha[27] wrote to Sen that he could not reply to his letter of 28 January as he had been travelling with the University Commission. He was sorry to learn that the UNESCO was going through so much trouble. Sarvepalli Radhakrishnan has gone there, Saha had briefed him about Sen's case and Radhakrishnan would do his best. Saha advised Sen to contact him and also to write to Dr BC Guha who was still in Calcutta about the post in DVC. Regarding the Association, the building plan was ready and a contract would be signed soon. The first floor would cost about 10 lac and the construction would start shortly.

VI

As early as in April, Sen made up his mind to go back to Kolkata[28]. Saha wrote[29] that he was glad to know that Sen was coming back before 20 June. He advised him to take a sea-voyage. He had asked his eldest son Ajit Kumar to visit France while Sen was still there so that he could arrange Ajit's meeting with the scientists there. It seems Saha was still trying for Sen a job in the External Affairs ministry. He wrote that while in Delhi the other day, he gave Sen's application to Sir GS Bajpai, Secretary-General of the Minister of External Affairs, right hand man of Panditji, but he was not very hopeful; anyway, Saha would write to Panditji. He was glad to know that CSF has been asked to

draw a project for the Radio Electrical Industry. Joliot-Curie has just set up a pile an account of which was published in *La Atom* and *Science et Vie*, Saha wanted the details about it.

Sen came back to Calcutta on 10 June, 1949 and remained with the Association until his superannuation in 1978. He breathed his last on 13 April, 1992.

VII

In between his coming back and demise, Sen authored or edited a number of books and held quite a few important positions. *bijnaner itihas* (in bengali) was published in two volumes (1955 and 1958) by the IACS with a foreword written by Sir JC Ghosh. It was later translated into Hindi. The book brought Sen the Rabindra Purashkar for 1955-56 and Narasimha Das Prize of Delhi University in 1957. Sen remained the Editor of *Science and Culture* for 30 years (1952-82), and a member of the Editorial Board of *IJHS* from 1965 onwards. From 1965 to 1985 he was on the National History Commission. He was the founder member of the History of Science Board, formed in 1960 and backed by INSA, at the Asiatic Society under the Chairmanship of Dr AC Ukil. At the Asiatic Society, he was the Natural Scientist member of the Council (1983) and a Professor of History of Science (1985-87). Associated with INSA as a superannuated scientist *sine die*, Sen took up two important projects, namely 'Foundation of Ancient Methodology of Theoretical Sciences in Indian Tradition' and 'History of Science, Philosophy and Culture' (10 Volumes).

Sen's other publications include *Bibliography of Sanskrit Works in Astronomy and Mathematics* (with AK Bag and SR Sarma), *A Concise History of Science in India* (edited with DM Bose and BV Subbarayappa), *The Sulba Sutras* (with AK Bag), *Ancient Glass in India* (with Mamata Chaudhuri), *The History of Astronomy in India* (edited with KS Shukla), *Cultural Heritage of India* Vol VI (edited with P Ray), *Scientific and Technical Education in India (19th Century), Bibliography of Physics, Astrophysics, Astronomy and Geophysics 1901-1950, History of Magnetic Studies; Professor Meghnad Saha, His Life, Work and Philosophy; Biography of Sir CV Raman; Biography of Mahendralal Sircar* (Bengali).

Samarendra Nath Sen was a debater *par excellence*, an able administrator, an erudite scholar and, above all, a lovable personality. I pay my homage to this "Needham of India", whose *bijnaner itihas* confirmed what our history teacher at school used to tell us, 'history has its own dynamics'!

Notes

[1] Saha, MN, 12 December 1947, SN Sen Papers, Meghnad Saha Archives (MSA), SINP.
[2] Sen, SN, 23 December, 1947, do.
[3] Saha, MN, 22 January 1948, do.
[4] Sen, SN, 2 February, 1948, do.
[5] Saha, MN, 9 February, 1948, do.
[6] Saha, MN, 11 March, 1948, do.
[7] Saha, MN, 6 May, 1948, do.
[8] Saha, MN, 9 February, 1948, do.
[9] Sen, SN, 18 February, 1948, do.
[10] Saha, MN,11 March, 1948, do.
[11] Sen, SN, 6 March, 1948, do.
[12] Saha, MN, 18 March, 1948, do.
[13] Saha, MN, 11 March, 1948, do. Saha's mistake! Needham did not resign until mid-April, 1948.
[14] Sen, SN, 6 April, 1948, do.
[15] Saha, MN, 6 May, 1948, do.
[16] Sen, SN, 10 May, 1948, do.
[17] Saha, MN, 19 May, 1948, do.
[18] Sen, SN, 27 May, 1948, do.
[19] Saha, MN, undated, do.
[20] Sen, SN, 23 July, 1948, do.
[21] Saha, MN, 28 July/2 August, 1948, do
[22] Sen, SN, 12 August, 1948, do
[23] Sen, SN, 10 September, 1948, do.
[24] Sen, SN, 4 November, 1948, do.
[25] Saha. MN, 5 November, 1948, do.
[26] Sen, SN, 28 January, 1949, do.
[27] Saha, MN, 7 February, 1949, do.
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RETRACING MEDICINE AND POLITICS IN COLONIAL BENGAL, c. 1920 - c. 1940

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This paper intends to explore the colonial medical policy and politics between 1920 and 1940 in a single colonial province, i.e. Bengal - that includes the present-day West Bengal and Bangladesh. Bengal being the initial seat of British rule in India received the prime importance and attention of the Raj in every field of administration. Thus, all health policies and activities were primarily oriented in or around Calcutta – the capital of the province of Bengal.

This article attempts to explore the concern and aims of the colonial government to ensure good health and the eradication of epidemics among the common populace within the specific period (1920-1940) of study. The chronological framework of this study is significant. The year 1920 marks the initiation and implementation of reforms started after the promulgation of the Government of India Act, 1919. These reforms (associated with Montagu and Chelmsford in 1918-1919) mark a crucial shift in the health policy of the colonial rulers as health now became a state subject. The 1919 reforms drew upon two Royal Commission Reports and proposals to extend 'Indianisation' and to transfer several departments of the government to provincial ministries, responsible to elected assemblies. The decade of the 1920s is (critically) significant as the British medical system seemed to be in total domination over the traditional Indian system of medicine out of the boon of modern medical technology and its globalisation. During this period one witnesses greater public health activity in Bengal than ever before e.g. the enactment of Opium Act and the Local Excise Act for controlling the drugs[1], establishment of All India Institute of Hygiene and Public Health (1939) etc.

In 1935, the Government of India Act not only endorsed a large measure of autonomy to the provinces of British India (ending the system of diarchy introduced by the Government of India Act 1919) but also vested more power for strategic policy making and its

implementation. After the provincial elections of 1937, India, during the decade of the 1940s, was ushered into a new era of public health delivery system, both at the centre and in the provinces with an increased number of participation of Indian people. These efforts reached a climax with the Drug Act of 1940 and its various recommendations. The end of the Second World War also marked the beginning of the process of decolonisation in Asia and elsewhere. The decade of the 1940's also witnessed the formation of Health Ministry as well as the advisory participation of the World Health Organisation (WHO) in Independent India. This paper seeks to engage with and review the early twentieth century medical history of colonial India with the help of essential primary sources that deal with aspects of public health. While exploring the emergence of politics associated with medicine, it would weave in the socio-cultural impact these generated. Thus, another related area that would be explored would be the manner in which the 'public' saw and related to these initiatives. In this sense, this work would examine both the attitudes of the indigenous people and the colonial state and its health establishment. It would also examine the professional alternatives of the traditional healers or practitioners and their interactions with the new system of western medicine.

We might have the misperception that the concept of health and hygiene commenced in India during colonial rule. But, India already had a heritage of health and healing without a much organised concept of community health delivery services. The long course of interactions between the 'Oriental' and 'Occidental' medical systems ultimately offers us serious possibilities to explore the influence of politics and ambivalence of both the systems of medicine in British India.

It is noteworthy that public health under British India was an innate political process. There existed a clear relationship between disease and the way society was structured. Income distribution, allocation of resources to ensure sufficient infrastructure for transport, housing and education and how much political support there was to provide adequately for those fundamental services – all these had impact on the health of the common populace. They had particular relevance for the health of certain groups within the population who did not have the political, social and financial resources to advocate for change.

The social view of health considers issues such as the impact of social and economic factors on health, but these dimensions have often been overshadowed by a biomedical view of health. A biomedical model of health predominantly had as its focus diagnosing diseases. The model's focus does not take into account the role of social factors and it also overlooks the issue of prevention of disease. In the 1940s the World Health Organisation (WHO) defined health as a state of complete physical, social and emotional well-being and not merely the absence of disease or infirmity. It definitely refutes the exclusive biomedical perspective of health. 'Health' is always difficult to gauge or measure because it is a dynamic concept rather than something that is always the same. We cannot define health without reference to any goal as it is a dynamic state of well-being characterised by a physical, mental and social potential. It is much easier to measure disease or the absence of disease, than to measure health or well-being.

Medico-Political approach of Public Health.

Public health deals with the cross section of a comparatively large population. The word 'public' came from the Latin word *publicus* (i.e. of the people). The most important parameters in public health delivery services like vaccination, epidemic control, immunisation and general medical care systems offer us an enthralling matrix to explain the changing dynamics of public health and public discourse on medicine in colonial India following the concept of *The Structural Transformation of the Public Sphere,*[2] of Jürgen Habermas, an eminent German sociologist. The 'public sphere' is an area in social life where individuals may come together to freely discuss and identify societal problems, and through that discussion influence political action. It is a logically rational (discursive) space in which individuals and groups come together to discuss issues of mutual concern and, where possible, to reach a common view.

The connection between capitalism, public health and medicine in colonial Bengal during the early twentieth century played a crucial role of power and politics by the name of medicine in the development of discourse and social actions. This in turn revealed the ways in which matters pertaining to healthcare and the colonisation of the body have provoked much debate among patients, medical practitioners,

government health personnel (Sir Ronald Ross, Waldemar Haffkine, and so on) and various indigenous communities throughout India.

By providing detailed analyses of the critical link, this article tries to explore a wide range of issues illustrative of the connection between medicine and matters of public concern at the moment of ushering in western medicine, medical professionalization and the formation of public health policy in India.

It is quite evident that capitalism was a global phenomenon from its birth, not only by way of trade, but also by way of pillage of resources from the colonies that underpinned capital accumulation in the metropolis. Habermas developed his study within the context of the institutional analysis of the transition from the stage of liberal market capitalism of the nineteenth century to the stage monopoly capitalism of the twentieth century developed by the Frankfurt School. After 1858, the political and social structures transformed once again at the beginning of the twentieth century and a clear shift in power was manifested in the transition from competitive capitalism to monopoly capitalism. The type of market freedom and free competition, safeguarded during much of the second half of the nineteenth century, now adapted to a social structure where increased government intervention and power seemed to be overarching. Habermas emphasizes this shift in power as the foundation of the structural transformation and the downfall of the bourgeois (and the critical) public sphere.

The conditions for citizens to form critical discussions and dialogues got altered, and with the rise of monopoly capitalism the boundaries between state, market and the citizens' intimate sphere were dissolved. State economic intervention in the free market (in the form of taxes and legal restrictions) meant that the concerns previously linked to the intimate sphere (such as health care) became institutionalized.

However, significantly capitalism in India was distinctly associated with the process of colonization. Consequently, the notion of the public and particularly ideas related to public health need to be located within this process of colonization which impacted the government and its ideas of public health. Alongside a host of other factors that ranged from pressures of private interests, the emergence of political parties and other organizations together conditioned public health and the policies associated with it.

Historiographical account

Jürgen Habermas's *The Structural Transformation of the Public Sphere* is an immensely important and significant book that left a major impact on diverse disciplines. It encouraged, promoted and advocated the extremely productive discussions along with the hermeneutics of public life, civil society, liberal democracy, and social changes in the twentieth century. Habermas's focal point of democratisation was emphasised by the practice of participatory politics to promote the essence of self-development in a democratic society. His study *The Structural Transformation of the Public Sphere* differentiated various forms of an active, participatory bourgeois public sphere in the heroic era of liberal democracy, with the more privatized forms of spectator politics in a bureaucratic industrial society, in which the media and elites controlled the public sphere[3] :

> Our investigation is limited to the structure and function of the *liberal* model of the bourgeois public sphere, to its emergence and transformation. Thus it refers to those features of a historical constellation that attained dominance and leaves aside the *plebeian* public sphere as a variant that in a sense was suppressed in the historical process. In the stage of the French Revolution associated with Robespierre, for just one moment, a public sphere stripped of its literary garb began to function - its subject was no longer the 'educated strata' but the uneducated 'people.'[4]

The two major themes of the book include analysis of the historical genesis of the bourgeois public sphere, followed by an account of the structural modification of the public sphere in the contemporary era with the rise of state capitalism, the culture industries, and the increasingly powerful positions of economic corporations and big business in public life. On this account, big economic and governmental organizations took over the public sphere, while citizens became content to become primarily consumers of goods, services, political administration, and spectacle. Generalizing from developments in Britain, France, and Germany in the late eighteenth and nineteenth century, Habermas first sketched out a theoretical account of what he called the 'bourgeois public sphere' and then analysed its degeneration in the twentieth century. Following the Government of India Act, 1919,

the colonial government offered partial participation by means of decentralisation of health as a state subject. Instead of democratic participation, there existed rather a Eurocentric operative administration that promoted, encouraged and secured the imperial interests. After all, in colonial India the perspective and practice of participatory politics had been just a dream. Many historians like Mark Harrison, David Arnold and Kabita Roy have supported the same position regarding the 'Eurocentricity' of public health policies in India in their research.

David Arnold was quite clear in discussing colonialism and its attitude toward medicine, with a special emphasis on Indian medical policy as a particular case study. According to Arnold the army and jail (the primary focus of the elitist Eurocentric colonial policy) took a centre stage of colonial health policy in India. He suggestively described the 'colonisation of body' in his landmark research *Colonizing the Body: State Medicine and Epidemic Disease in 19th Century India*.[5] The pertinence of David Arnold's argument revealed the form and functions of the political ideologies and the medical technologies, in combination with colonial attitude.

Mark Harrison[6] criticised these Eurocentric policies and priorities that hindered the growth of public health in India:

> What emerged in British India, it is claimed, was a 'distinctly colonial mode of health care' characterised by residential segregations and neglect of the indigenous population. The core of this argument – that colonial medical policy privileged the needs of Europeans and the military – is largely beyond disputes.[7]

In this regard, Radhika Ramasubban in her article shared the same point.[8] Also, she mentioned some other factors responsible for the evolution of imperial public health policy in India. The transfer of technologies for disease control was often influenced by popular scientific theories, the international pressure to restrict human and material movement, and political, economic considerations. Moreover, the military aspirations of the imperial government were no less responsible for the slow growth of public health.

As a matter of fact, Mark Harrison did not observe the proper maturation of public health in British India even after the World War

I (WWI). Unlike Britain, the funds for medical care and medical research were quite inadequate after the War. The financial stringencies of public health policy in British India retarded the progress of health and medicine and promoted the politics of difference and discrimination on a large scale. Another historian Roger Jeffery also supported this political deprival.[9] Nevertheless, during the first half of the twentieth century, public health policies did to some extent succeed in earning the confidence among some sections of the common populace.

Kabita Roy in her book *History of Public Health, Colonial Bengal 1921-1947*[10] explains the reasons behind the deplorable failure of public health in colonial Bengal. In her exploration, she identified diverse factors of negligence and carelessness of the regime towards the public health delivery system, e.g., government failed to execute the proposal of the Montagu-Chelmsford reforms thoroughly. Control of major lethal epidemics (malaria, cholera, small pox, etc.) failed severely for many reasons like understaffed and ill-equipped public health delivery system, poor sanitation and unhygienic conditions, malnutrition and lack of potable water etc. Even the administration could not create minimum education and awareness to eradicate social stigma, superstition and mal *du siècle*.

Thus, the failures of public health policies were owing to the practice of large scale politics of the colonial administration. Needless to say, it was exploited as a useful 'tool of empire' for the benefit of colonial governance. In this respect, Mark Harrison located western medicine as a 'tool of empire' that aimed to control, conquer and settle the periodic outbreak of epidemics, where medical policy was much more selective and piecemeal. He reckons that the colonial administration was very successful as far as military sanitation and hygiene were concerned. Nevertheless, the concept of medicine as a 'tool of empire' has even less meaning when applied to the relationship between preventive medicine and colonial development.[11]

In the course of European colonial expansion, western medicine did not pursue a steady course. In fact, western medicine attained the climax of its greatest significance in imperial ideology and practice over 1880s and 1930s – i.e. the period when European colonialism reached its peak. In the beginning, the Europeans in India, for example,

depended heavily on the available indigenous medicine for all tropical diseases. But, colonial interactions with indigenous medicine almost ceased owing to the advent of advanced European medical technology and knowledge in the field of bacteriology contributed by Louis Pasteur, Dr. Edward Jenner, and Robert Koch, etc. Slowly and steadily the western medical system enforced their authority over indigenous medicine and the people in India. This monopolistic approach of western medicine was finally accomplished by the Drug Act of 1940. This long journey of western medicine was not at all facile, as it gave rise to many discontents among the population owing to their long association with traditional medicine.

The course of 'traditional' Indian medicine's voyage since the ancient period to the colonial era has been studied by Charles Leslie.[12] He delineates the reactions of the traditional society on whom the medical policy was imposed by the colonial administration. The same, along with the contradiction of both the systems of medicines, is elaborately described by Poonam Bala.[13]

On the other hand Biswamoy Pati and Mark Harrison in their edited book *Health, Medicine and Empire: Perspective on Colonial India,* depict the emergence or evolution of the western medical policy within the colonized populace.[14] The hermeneutics of Pati and Harrison reveals the relationship between the European method and indigenous medical practices.

Also, the book *The Social History of Health and Medicine in Colonial India* by the same editors focuses on recent trends in research, addressing not only issues that have received attention in the past, but also less explored themes, such as medical research in colonial India, the practice of morbid anatomy and the role of medical advertisements.[15] These obviously have a distinct association with public health and related colonial health policies.

Locus classicus of the politics of medicine

Among the colonial rulers the word 'disease' was considered pejorative or negative by virtue of its meaning, since poor health was synonymous with bad governance being a cause of no confidence among the common populace. In every society disease assumes a wider social, political and cultural significance. It is recognized that disease is as

much an outcome of social and economic maladjustment as infection.[16]

Moreover, it signifies the failure of the exotic colonial science imported from Europe and discredit of governance. Hence, disease as per the rhetoric of the 1920s and 1930s was inseparable with a hindrance to 'development'. As a consequence, for example, the emphasis was on epidemic rather than on endemic disease, and on the curative system rather than that of preventive medicine. The reason behind it was also quite obvious. Thus, the government could deny and hide the endemic diseases since they are not much virulent and devastating unlike epidemics, which reveal the failure of the government to accelerate publicity against the disease. Besides, the western system of medicine could not be implemented due to lack of funds; neither were the traditional therapeutic systems encouraged. What is clearly noticeable is the absence of a proper mass oriented public health policy.

The apparent tension and conflicts between the colonial medical establishment and the people, the ideological factors and compulsions associated with western medicine and the associated political processes were all integral parts of western medicine. As a consequence, ambivalence was created by the imperial medical government leading to its confrontation with the indigenous medical system. Those piecemeal, frugal public health delivery systems severely told upon the health of womenfolk; they were the worst victim of the faulty public health policy.

The health of a community is an indicator of civilization of the said community. Medicine, rather health, is controlled by multiple and complicated parameters like politics, economics, education and/or awareness. As a consequence, management of health undoubtedly acts as the tool of political governance. The nucleus of the widespread colonial politics sought to assert European racial superiority and supremacy. These factors ultimately influenced medicine and medical policies, making them piecemeal and incomplete. These together frustrated the growth of medical policy, the public health delivery system and infrastructure responsible for good health. In every society, disease assumes a wider social, political and cultural significance. In a colonial context, this was conditioned along with a huge cultural gap between the ruler and the ruled, especially since western medicine was considered

as a symbol of victory of European supremacy. The coloniser saw the medical interventions as features that put India on the road to progress and a more 'civilized' social order.

The evolution of the western medicines and the medical policies that emerged to counter the invasion of epidemics, the comparative efficacy of political ideology vis-à-vis the western medical technology invites thorough scrutiny. In spite of severe negligence and indifference of the colonial government towards the people, they could not but intervene to control the epidemics to prove the supremacy of the West. Moreover, the focus was on the menace of epidemic diseases and sufferings of the army and European people, which prompted the colonial government to take certain effective measures. It is necessary to understand the preferences of the imperial medical service and the world of politics that determined the treatment of major tropical diseases. For instance, in order to prioritize the army, there was a serious discrepancy even in the pay scales between the civil and military surgeon. Military surgeons were more handsomely paid than the civil surgeons:

> There are, we find, 29 posts in Bengal reserved for military assistant surgeons. The pay of these officers is Rs. 200-700, while that of civil assistant surgeons is Rs. 200-450. So far as we can ascertain there is no advantage to the province from the employment of so many of the more expensive of these two classes of assistant surgeon, and no disadvantage would result from the replacement of the majority of them by members of the less expensive service.[17]

The political and economic interest of the British government in their colonies compelled them to restrict their medical services and facilities initially to European elite, neglecting the basic physique of 'native' people. European and Europe inclined patients in 'European Wards' got much more attention, care and nursing than patients of 'Indian Wards' in Medical College Hospital.[18]

Even the Eurocentric health policies vested their interest first and foremost towards their own army personnel. The selective health centric research and development programme reached only the ruling class and the elite. Repeated proceedings of the Drug Enquiry Committee report proved this fact,[19] e.g. Cinchona policy. IMS (Indian Medical

Services) was first developed for health administration maintained by its elite and Eurocentric status till independence. The Contagious Disease Act (1868) was introduced to protect the health of European soldiers. Then with time, the realization to protect the 'native' battalion for the interest of their own people dragged the colonial power to introduce public health among 'native' soldiers too. But that also was restricted due to the mutiny of 1857. The tension triggered due to the mutiny, not only affected the 'native' army but also the common populace. The wide difference between the ruler and the ruled deprived the 'native' people from acquiring good health.

Moreover, the provision of health services was essentially medical in character whereas preventive and sanitary measures received very low precedence. Nevertheless, the Act of 1919 emphasised on the necessity for proper water supply, sanitation and public health infrastructure.

To bring about a certain measure of parity, reform was proposed. The reformative suggestions were advocated by Montagu (as Secretary of State) and Chelmsford (as Viceroy), in 1918-1919, marked a decisive shift towards reform. It is necessary to study precisely the salient features of the Act in relation to reform.[20]

According to the Government of India Act (1919) Schedule I Part-II, provincial subject

1) Local Self Government, that is to say, matter relating to the constitution and power of Municipal Corporations, improvement trusts, district boards, mining boards of health, and other local authorities were established in the province for the purpose of matters arising under the Cantonments Act, 1910; subject to legislation by the Indian legislature as regards[21]:
   a) The power of authorities to borrow otherwise than from a provincial government.
   b) The levying by such authorities of taxation not included in Schedule II to the Scheduled Taxes Rule.
2) Medical administration, including hospitals, dispensaries, asylums and provision for medical education.
3) Public Health, sanitation and vital statistics, subject to legislation by the Indian Legislature in respect to infectious and contagious

diseases to such extent as may be declared by any act of the Indian Legislature.

4) Pilgrimage within British India.[22]

The 1919 reforms drew on two commission reports and other recommendations to extend 'Indianisation' and to transfer several spheres of government to provincial ministers,[23] accountable to elected assemblies. It was left virtually unchanged by the reforms of 1935[24] and was the basis of the Indian constitution after independence. Post 1947 policies in many areas followed the identical rules already laid down in the year of 1919.

In spite of great hope and expectation, Montagu- Chelmsford Reform (1919) could hardly bring improvement in public health. It could not influence the mortality or morbidity. It could create neither an effective improved methodology nor could bring any definite programme. A comparative study of the life expectancy in different countries would be very striking in this regard:

> The low level of health is reflected in the expectation of life in British India which is stated to be 27 years, in contrast to an expectation of 67 years in Australia, of 63 years in England-Wales, of 63 years in Germany and of 47 years in Japan.[25]

The comparative study of vital statistics in India and a few selected countries for the year 1937 is stated below :

Table 1 : Comparative Vital Statistics for the Year 1937: India and Selected Countries.

Countries	Death rate per 1000 population	Birth rate per 1000 population	Infant mortality Per 1000 birth
India	22.4	34.5	162
Australia	9.4	17.4	38
U.S.A.	11.2	17.0	54
England-Wales	12.4	14.9	58
Ceylon	21.7	37.8	158
Java	18.8	28.3	—
Japan	17.0	30.6	1.6

Source: Grant, John B. *The Health of India*, Oxford Pamphlets on Indian Affairs, No. 12, Oxford University Press, London, 1943, p.3.

The public health policy being an integrated medical services delivery system was more pro-political than pro-people. The most remarkable example was the creation of proper hygienic and sanitation habits among grass root level people, which neither required large amounts of money nor state of art medical technologies. As far as preventive measures are concerned, government laxity and negligence were apparent. The mentality and mindset of the government were no less responsible than the funds for it. In an introspective manner, the government admitted the shortcomings of preventive and curative measures:

> The prevention of cholera is a comparatively simple and inexpensive measure... Prevention requires early notification of the infection, and this must be followed by immediate action directed towards the disinfection of the *dejecta* and soiled clothing of cholera cases and the sterilization of those sources of water which have been polluted by their excreta and soiled clothing. Where this has been attempted in a few instances, very striking success has followed; ... Both of the modern sciences of epidemiology and applied sanitation originated in efforts first directed against cholera in Europe; and there is reason to believe that the carrying out by local authorities of organised measures for the control of cholera will be found to be the most effective method of awakening the sanitary conscience of the people.[26]

During the first half of the twentieth century nationalist leaders demanded launching the programme to include health on their own account for proper development of health among the people of the grass root level. Since the Act of 1919 included health under the responsibility of Bengal Assembly, these elite nationalist leaders represented in the Assembly tried to improve the policy concerned with mass health improvement within the ambit of their power and scope. But their efforts fell flat owing to the strong financial stringency and lack of executive power to implement them. Even in 1945 rural sanitation greatly suffered due to lack of funds.[27] There remained a wide difference between aspirations for the improvement of public health and the lack of capability to bring this forth.

The government was partially successful to control the disease by means of their health policies like sanitation, drainage and sewerage, institutionalization of western medicine, framing of Acts, Research

and Development, etc. But at the same time, it failed to create a new mindset among the common people to accept, execute and popularise western medicine, effectively since it was exotic to the Indians. Most importantly, thus the pathetic condition of the family when it comes to delivering services associated with public health was apparent. The health of the mother and child was inexcusably neglected during the period examined.

For instance, Dr. Jean M. Orkney, Professor of the Maternity and Child Welfare Section of All India Institute of Hygiene and Public Health, Calcutta reported:

> The Maternity and Child Welfare Department is one of the two sections at the Institute for which the Government has not found it possible to make budget provision. Statistical evidence of the need for Maternity and Child Welfare is overwhelming. Further, the national health and national wealth depend ultimately on the physical soundness, the mental alertness, and the social adjustment of the individual, and since these attributes are decided in childhood, the delay in the opening of a Maternity and Child Welfare Section is very regretable (sic).[28]

Besides, factors such as health economics, the racial ambivalence of medicines, vaccines and colonial political interests largely vacillated and affected the mentality of the government. Even when the colonial government tried to move one step forward, it ultimately retreated as it had to consider factors like the political surplus and colonial profits. All these parameters ultimately led to the making of a public health policy which was politically motivated, incomplete, piecemeal and largely ineffective.

The basic shortcomings of the government for the cause of low level of health in India were *identified in the Report of the Health Survey and Development Committee:*

> The maintenance of public health requires the fulfilment of certain fundamental conditions, which include the provision of an environment conducive to healthful living, adequate nutrition, the availability of health protection, preventive and curative, to all members of the community irrespective of their ability to pay for it and the active co-operation of the people in the maintenance of their own health. The large amount of preventible (sic) suffering

> and mortality to which reference has already been made is mainly the result of an inadequacy of provision in respect of these fundamental factors. Environmental sanitation is at a low level in most part of the country, mal-nutrition and under-nutrition reduce the vitality and the power to resistence (sic) of an appreciable section of the population and the existing health services are altogether inadequate to meet the needs of the people, while the lack of the general education and health education add materially to the difficulty of overcoming the indifference with which the people tolerate the insanitary conditions around them and the large amount of sickness that prevails.[29]

According to the report the major factors behind the huge suffering lie in the prevalence of insanitary conditions, dietary malnutrition, inadequate medical cum preventive infrastructures, lack of basic as well as health education etc.

It is noteworthy that this survey report was not the outcome of the indigenous people; rather it was the objective, unbiased and professional findings of the experts in relation to public health of the colonisers.

The step motherly attitude of the colonial government vis-à-vis traditional therapeutics in the early years of the twentieth century deserves serious scanning. Within the purview of history of medicine, the ambivalence of both the systems exposed the limitations, inadequacies and failure of the government, along with the step-motherly attitude towards the existing traditional system of medicine. On account of the primacy of colonial interests, the government made every attempt to discriminate against and marginalise the traditional therapy. Ultimately the latter was forced to get obsolete owing to the pressure of colonial politics. Owing to poor infrastructure of western medicine, the majority of populace depended on folk medicine involving diverse practices. The benefit of folk medicine included its inexpensive nature, and it did not require any formal training to acquire expertise in this area. The prevalence and appeal of those practices lie in the form of tantric[30], tabiz[31], maduli[32]. And, in spite of all efforts on the role of the government, folk medicine survived among a certain cross section of the society and it still exists today.

In rural areas of Bengal, most of the time folk practitioners were the only healers. Dr. M. N. Banerjee, president of Ayurvedic Committee

pointed out that as the government had done away with the old vernacular standard of medical education which used to supply rural practitioners (hospital assistances), which was on the verge of extinction. As the sub-assistant surgeons were quite beyond the means of villagers, there was no other solution for the medical relief for the masses.[33]

On the other hand, with the extinction of the *Kavirajas*[34] along with other indigenous therapists, some half educated and illiterate doctors took forefront of the treatment in the villages. Those self-declared doctors were either compounders or dressers; who dominated all over Bengal by means of their boastful manners with a little or incomplete medical knowledge.[35] Therefore, the common populace was helpless and frustrated to find no one dependable in case of treatment of their diseases. That is why many comical parodies, composed to humiliate the role of doctors as well as *Vaids*[36], became very popular as the maxims or proverbs in Bengal exposing their professional and social status:

Lathi pore nahi laj, amar nam kaviraj.[37]
Namey Dhawantari, kaje jam.[38]

Unfortunately various magico-religious entities of indigenous modes of treatments like myth, folk medicine, faith healing etc. were the most popular means of treatment among the majority of the poor people during the British regime. Illiteracy, poverty and religious fanaticism have pampered, promoted and popularized those versions of practices among the common populace, mostly women.

The health of women exposes the wretched condition of public health politics and demands an intensive investigation. A woman is considered as the 'second sex', the 'lesser sex', the 'weaker sex' etc. Indian traditions have assigned women a lower status than men in society. This traditional attitude towards women dumped them within the paw of myth and superstition. That is why they are the social victims as well as the political victims and hence their health is insignificant. It is by now well documented that the health status of Indian women is extremely low[39]. This is all the more ironic since the primary caretakers of a household's health are women. In Indian scenario the prime cause of a lower status and levels of wellbeing of women and girl vis-à-vis men and boys is that the latter was ascribed a higher social value than the former. Due to this inherent difference in their social status and position, women tend to become

marginalized. This distinction is apparent in the realm of health too. In his *History of British India* James Mill had rightly observed:

> The condition of women is one of the most remarkable circumstances in the manners of nations, and one of the most decisive criterions of the stage of society at which they have arrived. Among rude people, the women are generally degraded; among civilized people they are exalted.[40]

The Honorary and Joint Secretaries, Central Committees, Counts of Dufferin Fund expressed their concern about venereal diseases among women in India in 1919 as follows:

1) There is an enormous amount of venereal disease among Indian women, being variously estimated as 25 per cent, of total attendances- 75 per cent, of all patients almost universal in some classes- 75 per cent, of lower classes and 50 per cent of respectable classes.
2) It is the origin of the greater part of the gynaecological disease from which so many Indian women suffer.
3) It is the cause of an immense number of miscarriages and births of still-born infants and leads to a great deal of blindness and debility in the survivors.
4) In the tertiary stages of syphilis, it leads to numerous diseases which very seriously incapacitate numbers of the population and frequently lead to an early death. In addition 50 per cent of all cases of blindness in children are due to venereal disease, while syphilis stands fourth in the list of killing diseases.
5) Of 21 medical women who have replied to questions asked, who are all highly qualified and most of whom represent important hospitals, only four carry on diagnosis or treatment according to modern methods. One of these states she can only do so to a limited extent owing to lack of funds.[41]

The one state medical measure before the 1880's which has a direct bearing on women was the Contagious Disease Act of 1868. But this was clearly designed to address the problem of several diseases among British soldiers rather than the health problems of prostitutes or a soldier's wife. Moreover, various social stigmas deprived the victim of cure from the venereal diseases.[42] In his correspondence, Mr. J.

Donald, Secretary to Government of Bengal addressing to the Secretary of Government of India alleged against incomplete research training for students in case of venereal diseases:

> ...students are trained in recent diagnostic method in the preparation of associated (sic) with venereal diseases and proper facilities exist for the clinical bedside tuition with regard to the various manifestations of these affections. No arrangements exist in the bacteriological Department of these institutions for practical instruction in the expert and technical details necessary for the diagnosis of syphilis by the 'Wassermann-reaction' but lectures on the principles and value of this important serological test are delivered to students in the latter part of their curriculum.[43]

A doctor known as of Dr. Lee, pointed out the improper set up in the port area to control venereal diseases.[44]

Besides, the custom of early child marriage, *purdah* system, the lifelong enslavement and physical confinement ruined their physique, health and mind. Women's access to medical treatment was probably most affected by *purdah*, or seclusion practices, which not only inhibited women's access to public sphere where their modesty might be compromised but it also limited their access to care, money and legitimate reasons for leaving their house.[45]

The aftermaths of the inferior status have found expression in various forms – viz. female infanticide, female foeticide, a higher death rate among women, lower life expectancy, lower literacy levels, higher morbidity, lower level of employment and an adverse sex ratio. While maternal and reproductive health issues constitute an important area of women's health, they are by no means the only ones that need to be addressed. In fact, a large volume of research provides evidence of other equally important areas – e.g. nutrition, higher female atrocity, inadequate availability of health care during illness and lack of access to medical services. During independence, the Health Survey and Development Committee (Bhore Committee, Government of India, 1946) were emphatic on universal accessibility to health care. But poverty, ignorance and consequent insanitary condition played a very important role in health deterioration. According to Director of Public Health, the number of infant mortality in 1941 was 248, 894.[46] In fact, what was supposed to be 'tradition' and implied large scale illiteracy and poverty among women were reinforced and promoted during colonial rule.

Epilogue

This article assumes significance today when health is not just an issue related to doctors or hospitals. After all, it is a subject matter associated intrinsically with social justice. The interplay between 'colonial' and 'colonised' body politics largely promoted politics rather than the world of wellness in terms of health. The same tradition of medical politics seems to continue even today. Western medicine had arrived in India as a colonial version of an applied science, and moved from the 'city' to the 'country', including the remotest villages. It influenced the faulty and insensitive public health policies, even as it exerted a strong influence over the colonized people. Ironically, in many ways the present does contain elements of the past – an aspect that needs to be studied and critiqued since India is a free country today.

Notes

[1] Education, Health and Land (Health) Department, Progs. A, No. 147, February 1927 (National Archives of India, hereafter NAI).
[2] Jürgen Habermas, *The Structural Transformation of the Public Sphere*, trans. by Thomas Burger, MIT Press, 1989.
[3] Jürgen Habermas, Sara Lennox and Frank Lennox, 'The public sphere: An Encyclopedia Article (1964)', *New German Critique*, No. 3, (Autumn, 1964), p.52.
[4] Jürgen Habermas, *The Structural Transformation*, op.cit. p.xviii.
[5] David Arnold, *Colonizing the Body: State Medicine and Epidemic Disease in 19th Century India*, Oxford University Press, New Delhi, 1993.
[6] Mark Harrison, *Public Health in British India: Anglo-Indian Preventive Medicine, 1859-1914*, Cambridge University Press, New Delhi, 1994.
[7] Ibid. p. 227.
[8] Radhika Ramasubban, 'Imperial Health in British India, 1857-1900', in Roy Macleod and Milton Lewis (eds.), *Disease, Medicine and Empire: Perspective of Western Medicine and Experience of European Experience*, Routledge, London, 1988.
[9] Roger Jeffery, *The Politic of Health in India*, University of California press, Berkeley, 1988.
[10] Kabita Roy, *History of Public Health, Colonial Bengal 1921-1947*, K. P. Bagchi & Co., Kolkata,1997.
[11] Mark Harrison, op.cit. p.228.
[12] Charles Leslie (ed.), *Asian Medical System: A Comparative Study*, University of California, Berkeley, 1976.
[13] Poonam Bala, *Imperialism and Medicine in Bengal: A Socio Historical Perspective*, Sage Publication, New Delhi, 1991.
[14] Biswamoy Pati, Mark Harrison (eds.), *Health, Medicine and Empire: Perspective on Colonial India*, Orient Longman, Hyderabad, 2001.
[15] Biswamoy Pati, Mark Harrison (eds.), *The Social History of Health and Medicine*

in Colonial India, London & New York, Routledge, 2009.

[16] John B Grant, *The Health of India,* Oxford Pamphlets on Indian Affairs, No. 12, Oxford University Press, London, 1943, pp. 2-4.

[17] *Report of the Bengal Retrenchment Committee 1923,* Government of Bengal, Bengal Secretariat Book Depot, 1923, p.80.

[18] *Bengal Legislative Assembly Proceedings, 1940,* Vol. LVIII. No.7, Eighth Session, Official Report, Bengal Secretariat Book Depot, Calcutta, 1941, p.273.

[19] Education, Health & Land Dept. Health Br. File No. 54- 2/36-H (NAI).

[20] *The Bengal Legislative Council Manual, 1927,* First Edition, Bengal Secretariat Book Depot, Calcutta, 1927, pp. 136-137.

[21] Ibid.

[22] Ibid.

[23] Joseph Bhore, *Report of the Health Survey and Development committee,* Vol. II, Government of India Press, 1946, pp.1-4.

[24] Ibid.

[25] John B Grant, op.cit. pp.3-4.

[26] Dr. Charles A. Bentley, *Fifty-third Annual Report of the Director of Public Health for Bengal, 1920,* Bengal Secretariat Book Depot, Calcutta , 1922, pp. 9-10.

[27] Health Dept. Public Health Br. File No. 23- 8/45- PH (NAI).

[28] *Annual Report of the All India Institute of Hygiene and Public Health,* Calcutta, 1934, p.42.

[29] Joseph Bhore, *Report of the Health Survey and Development Committee,* Vol. I, Government of India Press, Calcutta, 1946, p. 11.

[30] Doctrine of mystical and magical writing.

[31] Amulet use in Muslim folk medicine.

[32] Amulet use in Hindu medical practice.

[33] Education, Health & Land Dept. Health Br. Progs. A, No. 26-31, September 1926(NAI).

[34] Ayurvedic medical practitioner.

[35] *Vishak Darpan*, March 1914, p. 341.

[36] Indigenous practitioner of Hindu medicine.

[37] Sushil Kumar De (ed.), *Bangla Probad: Chhara O Chalti Katha*, A Mukherji & Co. Ltd., Kolikata, Bhadra 1369 (Bangabda), p. 49. It means that a Kaviraja is a shameless professional who tolerates the kicks of others.

[38] Ibid. It means that professionally claimed as efficient as Dhwanantari by but ultimately a representative of death in practice.

[39] Anindita Datta, "Articulation of an Integrated Women's Health Policy Using the Life Cycle Approach", *Indian Journal of Gender Studies,* Vol.10, No. 1, Jan-April 2003, p.29.

[40] James Mill, *History of British India (1817)*, Vol. I, Kisinger Publishing, U.S.A, 2010, p. 293.

[41] Home Dept. Medical - A, Progs.No.142-157, June 1920 (NAI).

[42] Home Dept. Medical - A, Progs. No. 55-57, September 1917 (NAI).

[43] Home Dept. Medical - B, Progs.No. 72-80, September 1917(NAI).

[44] *Annual Report on the Working of Hospitals and Dispensaries in Bengal,* 1927, Bengal Secretariat Book Depot, Calcutta, 1928, pp. 4-6.

[45] Roger Jeffery, op. cit., p. 48.

[46] Health Dept. File No. 23-8/45-PH(NAI).

AGHA AHMAD ALI AHMAD AND HIS CONTRIBUTION TO THE ASIATIC SOCIETY

M. FIROZE

Agha Ahmad Ali Ahmad (1839-1873) was a celebrated Persian scholar of Bengal. Born in Dhaka, the Agha spent the last twelve years (1862-1873) of his life in Calcutta, keeping himself engaged in various academic and scholarly activities — such as establishing a *madrasa,* named after him, as Madrasa-i-Ahmadiya, in the Taltola area of the city; serving as a teacher of Persian at the Calcutta Madrasa, which was then popularly known as Madrasa Aliah[1]; editing a number of Persian manuscripts of historical and literary importance at the Asiatic Society, which was then known as The Asiatic Society of Bengal[2]; compiling a book, entitled *Haft Āsmān,* on the history of manavi-writing in Persian at the behest of the Asiatic Society; and writing several books on Persian lexicography, grammar and prosody– before he went back to Dhaka, where he died at the young age of 34 years.

Since the present paper is confined to discussing only those works which were done by Agha Ahmad Ali at the Asiatic Society in Calcutta, it does *not* take into account those works which were done by the Agha *outside* the Society — even though they were produced *in* Calcutta — such as, a work on Persian lexicography, under the title *Mo'ayyade-e Borhān* (1865); a treatise on Persian robā'i (= quatrain) and its metres, under the title *Resāle-ye Tarāne* (1867); and a book on Persian grammar, entitled *Resāle-ye Eshteqāq* (1869).[3]

But, before we dicuss the works done by Agha Ahamad Ali at the Asiatic Society, it seems desirable to say something about the Agha, with special reference to his activities in Calcutta.

1 : Agha Ahmad Ali and his early years

The ancestors of Agha Ahmad Ali Ahmad belonged to Isfahan[4] in Iran. Some members of this Iranian family had migrated to India

in the early 18th century, because the German orientalist and a celebrated scholar of Persian language and literature, Henry Blochmann[5], in his biographical notice of Agha Ahmad Ali, says that "The late Maulawi Agha Ahmad Ali was the son of Agha Shujā'at Ali, whose family came with Nadir Shah to India".[6]

Ahmad Ali's pen-name was "Ahmad", while "Agha" was his family-title — the names of his grandfather and father being Agha Abdul Ali and Agha Shuja'at Ali respectively.[7] The latter was a renowned calligrapher of his time.[8]

Agha Ahmad Ali was, according to Blochmann, born in Dhaka, on the 10th Shawwal 1255, as indicated in his *tarikhi* name, Mazhar Ali.[9] Though Blochmann does not give the date of Ahmad Ali's birth in A.D., the Hijri date given by him corresponds to 17th December 1839.[10]

Agha Ahmad Ali received his education from one Jalaluddin Bokhari, at Dhaka[11] and, according to Blochmann, "distinguished himself at an early age by his extensive knowledge of Persian literature".[12] He had become famous as a scholar of Persian in those days and the celebrated Persian poet of Dhaka, Sayyed Mahmud Azad (1842-1907), who speaks of Agha Ahmad Ali as "my teacher (*ostādi*)", laments that after the demise of the Agha "the literary and academic ambiance in the city has lost its luster".[13]

2 : Agha Ahmad Ali in Calcutta

Agha Ahmad Ali came to Calcutta in 1279/1862.[14] The same year he established a *madrasa,* near the Calcutta Madrasa, in the Taltola area of the city, and named it, after his own name, Madrasa-e Ahmadiya, of which he remained the President till his death.[15]

Abus Sattar, who had written a pioneer work on the history of the Calcutta Madrasa in two voulumes, says that Agha Ahmad Ali, during his stay in Calcutta, used to frequently go to the Asiatic Society of Bengal to consult its rich library for his scholarly works, which brought him into contact with Mr. Cowell and Mr. Blochmann, who both were the regular visitors of the Society and who were so much impressed by his erudition that Mr. Cowell even appointed the Agha as his private tutor at a salary of sixty rupees a month.[16]

By "Mr. Cowell", Abdus Sattar actually means the noted translator of Persian poetry, Edward Byles Cowell (1826-1903), who lived in Calcutta from 1856 to 1867 and served as a professor of English history at the Presidency College and later on as the Principal of Sanskrit College.[17] Ahmad Ali seems to have taught Blochmann too, because the latter calls himself "his pupil".[18]

It was on the recommendation of Cowell that, in 1864, the then Principal of the Calcutta Madrasa, William Nassau Less,[19] appointed Agha Ahmad Ali as a teacher of Persian at the Madrasa.[20]

Referring to the appointment of Agha Ahmad Ali as a teacher at a scholar the Calcutta Madrasa, Abdus Sattar says:

> "It was the period when Mirza Ghalib had come to Calcutta and a function was going on at the Muslim Institute. In this function, the Agha was also present. A difference of opinion developed between the two on a certain scholarly issue."[21]

In this context, Abdus Sattar narrates how the difference of opinion between Mirza Ghalib and Agha Ahmad Ali Ahmad later prompted both of them to write books against each other.[22]

The above "incident", which is surprisingly repeated, without any reservation, by other scholars too,[23] is quite incredible, because Ghalib had been in Calcutta from February 21, 1828, to November 29, 1829,[24] when Agha Ahmad Ali was not even born! That they had written books against each other is, however, correct, though it was not in the context as wrongly narrated by Abdus Sattar above, but it was rather due to Agha Ahmad Ali writing a book *Mo'ayyad-e Borhān* (1863) aginst Mirza Ghalib's *Qāte'-e Borhān* (1862), which had unleashed a series of acrimonious writings by the supporters of both of them.[25]

Though it is not known how long Agha Ahmad Ali remained attached to the Calcutta Madrasa, it appears that he died in harness. He according to Blochmann, "died of fever on the 6th Rabi 1, 1290 (June 1873) at Dhaka, deeply regretted by his friends and pupils."[26] The conversion of the above-mentioned Hijri date to A.D. actually gives 3rd June, 1873.[27]

Here I am tempted to reproduce below the observation that Blochmann had made at the death of Agha Ahmad Ali; he wrote :

> "His (Agha Ahmad Ali Ahmad's) genuine enthusiasm for Persian literature, his profound knowledge of the language, his self-sacrificing kindness and singleness of mind made him a general favourite. His pupils lost in him a most excellent teacher and the Asiatic Society a painstaking and conscientious editor, whom it will be difficult to replace."[28]

3 : Agha Ahmad Ali at the Asiatic Society : Editing Persian Manuscripts

Apart from teaching at the Calcutta Madrasa, Agha Ahmad Ali had involved himself in editing Persian manuscripts of historical and literary importance at the Asiatic Society of Bengal. The celebrated orientalist, Henry Blochmann, in his biographical account of Agha Ahmad Ali, says:

> For the Asiatic Society of Bengal, Agha Ahmad Ali edited the masnavi entitled *Wis o Rāmin*, the *Sikandarnāmah i Bahri* (or *Iqbālnāmah i Sikandari*) by Nizami, the *Iqbālnāmah i Jahangiri*, the *Muntakhab uttawarikh* by Badauni, the *Maāsir i Alamgiri* and the first two fascicules of Abul Fazl's *Akbarnamah*.[29]

Agha ahmad Ali's editions of the six manuscripts, mentioned in the above extract, were published by the Asiatic Society of Bengal in its *Bibliotheca Indica* series, and I would like to discuss each of them below :

3.1 : Wis o Rāmin

Based on a love-story of Pahlavi origin, from ancient Iran, this Persian masnavi (narrative poem), *Wis o Rāmin* — which was composed by Fakhroddin As'ad Gorgani around 1048 A.D.[30] — was edited by Agha Ahmad Ali and published by the Asiatic Society of Bengal in its *Bibliotheca Indica* series in 1864, as it appears from its title page. The Agha seems to have worked on the single manuscript copy of *Wis o Rāmin*, which is preserved in the library of the Asiatic Society, Kolkata,[31] because, unlike his other edited works, he does

not point out the variation in the readings of the text in it. Since the manuscript copy of the work was a bit damaged[32], the Agha says at one plece, "It seems that two pages are missing here *(ma'lum mi shavad ke az injā do varaq gom shode ast)*"[32]. The book runs into 400 pages and at the end there is a six-page list of printing errors with their corrections.

It, therefore, goes to the credit of Agha Ahmad Ali, and for that matter to the Asiatic Society of Bengal, to bring out the earliest edition of *Wis o Rāmin*. It was, however, much later that this celebrated Persian masnavi was edited in Iran and other countries and translated as well.[34]

3.2 : Iqbālnāme-ye Jahāngiri

This history of the first nineteen years of the reign of the Mughal emperor Jahangir, compiled by Motamed Khan in Persian, was jointly edited by Maulavi Abdul Hai and Agha Ahmad Ali and published by the Asiatic Society of Bengal in 1865. Its title-page is both in English and in Persian, and it is recorded therein that the work was edited under the superintendence of Major William Nassau Lees and printed at the College Press, Calcutta, in 1865. The work was edited on the basis of three manuscripts as is evident from the footnotes wherein the editors specify that the variations in reading the text is according to what is recorded in either one, or in two, or in all the three copies he had collated.[35]

3.3 : Muntakhabut-Tawārikh

This general history of India, covering the period from the Ghaznavids down to the 40th year of Akbar's reign, written by Abdul Qadir Badayuni in 1595, was jointly edited by Sir William Nassau Lees and Agha Ahmad Ali and published by the College Press, Calcutta, in three volumes, in 1865. The work was edited on the basis of three manuscripts as is evident from the footnotes. As, for example, at one place, the editors point out that "In two of the copies, it is written as such, but in [the third] one, it is thus" and then he quotes the variants.[36] The editors often compare with other

historical works too. For instance, at one place, they, in the footnote, elaborate that "it is written as such in all the three copies, but in *Tabaqāt-e Akbar Shāhi,* it is written thus" and then they quote from the latter[37]. They often refer to dictionaries for elaboration. When, for example, Badyauni, while speaking of the 11th-century Iranian poet, Abol-Faraj Runi, whom he writes not "Runi: but "Ru' ini", says that "Ru'in is the name of a village, which was once one of the dependencies of Lahore, but these days it is deserted and no sign of it is found."[38]

3.4 : Sekandarnāme-ye Bahri

This is one of the five famous Persian masnavis which were composed by the great Iranian poet, Nezami Ganjevi (1140-1202 A.D.) at different periods and which are collectively known as *Khamse* (=quintet) or *Panj Ganj* (=five treasures). These five are: *Makhzanol-Asrār* (1165-66 A.D.), *Khosrow va Shirin* (1175-76 A.D.), *Leilā va Majnun*(1188-89 A.D.), *Sekandarnāme* (1191 A.D.), and *Haft Peikar* (1198-99 A.D).[39] Of these five masnavis, the fourth one, *Sekandarnāme* is divided into two parts, named *Eqbālnāme* and *Kheradnāme.* (These two parts are often called in Iran *Sharafnāme* and *Eqbālnāme,* and in India *Sekandarnāme-ye Barri* and *Sekandarnāme-ye Bahri* respectively.[40]

Of this *Sekandarnāme-ye Bahri,* the first half was edited by the Austrian orientalist, Aloys Sprenger[41], in collaboration with a Persian scholar, Agha Mohammad Shustri, and published by the Asiatic Society of Bengal, in 1852, as Fasciculus-I.

It was after a long gap of seventeen years that the second-half of *Sekandarnāme-ye Bahri* was edited by Agha Ahmad Ali and published by the Asiaatic Society of Bengal, in 1869, as Fasciculus-II.

3.5 : Ma' āthir-i-'Ālamgiri

This famous history of the reign of the Mughal Emperor, Aurangzeb, who ruled from 1658 to 1707, was written by Mohammad Saqi Musta'id Khan in 1710. It was edited by Agaha Ahmad Ali and published by the Asiatic Society in its *Bibliotheca Indica* series in 1873. The title-page of the book runs in Persian thus: *Ma'āthir-i-*

'Ālamgiri/ by Mohammad Sāqi Musta 'id Khan/ edited by (*be-tashih-e Janāb*) Agha Ahmad Ali/ Teacher of (*modarres-e*) Madrasa-e Aliah, Calcutta/Printed by the order of (*be-hokm-e*) the Asiatic Society of Bengal/in the Baptist Mission Press/located in the city of Calcutta/ in the year 1871.

It was this Agha Ahmad Ali's edition of *Ma'āthir-'i-'Ālamgiri* which was translated into English by Jadunath Sarkar, in 1947, and on every page of the translation he indicates the page-number of the original, as he clarifies: "The *figure* within square brackets indicate the page-numbers of the Persian text as printed in the Bibliotheca Indica series, edited by Āghā Ahmad 'Ali, Calcutta, 1871 A.D." [42]

For editing *Ma'āthir-i-'Alamgiri,* Agha Ahmad Ali had not only confined himself to the manuscript copy of the work, which was preserved in the library of the Asiatic Society of Bengal, but also collated it with two other copies of the work, because whenever there is a variant reading of a certain word or sentence, he points it out in the footnote as to what all the three copies say in this regard.

Agha Ahmad Ali had tried to edit the work carefully and meticulously, some examples of which are given below:

i) If at some places, the meaning of a certain word used in the text was not clear to him, he kept it the same way and added a note on it. As, for example, with regard to the word *jār* he says in the footnote: "It is in the same form in one copy, while in the other copy it does not exist." [43] Similarly, when the text, at one place, contains a sentence of Hindi language in Persian script, the Agha writes it in the same form and points it out in the footnote that "the words used in these two Hindi expressions are ambiguous (*alfāz-e in do feqre-ye hindi mashkuk mānde*).[44]

ii) If certain words used in the text needed clarification or elaboration, the Agha tried to solve them with the help of different historical works, like *'Ālamgirnāma, Ma'āthir-ul-Umarā, Tazkira-i-Chaghtā, Mantakhab-ul-Lubāb* and *Miftāh-ut-Tawārikh* and referred to the sources in the footnotes.[45] In this connection, he consulted the dictionaries too. For instance, when he comes

across a word *puzeshk* in the context of medical treatment, he says that though it is written the same way in the other two manuscript-copies of the work too, it is written as *pezeshk* in the lexicons (*dar farhang-hā*)[46] — and he is right, because the word *pezeshk* is still used for "physician" in contemporary Persian language.

iii) If the dates used in the text required rectification, the Agha discusses in the footnotes. For example, the conquest of Hyderabad by Shah Alam Bahadur is mentioned under the events that took place in 1096 A.H. but a poem by Nemat Khan 'Āli that the author of *Ma'āthir-i-'Ālamgiri* quotes in this context gives the date of the event as 1097 A.H. This point is discussed by the Agha in the footnote, wherein he says that *Tazkira-i-Salātin-i-Chaghtā* also puts the event in 1096 A.H.[47], which he seems to think more acceptable.

3.6 : Akbarnāme

This celebrated history of Akbar's reign, compiled by Abul Fazl, runs into three volumes, of which the first volume was edited by Agha Ahmad Ali Ahmad in collaboration with Maulavi Abdur Rahim, and published by the Asiatic Society of Bengal, in 1877, which means four years after the death of the Agha. The work, as mentioned on this title-page in Persian, was printed at Mazharul-'Ajā'eb, well known as Urdu Guide Press, Calcutta, and its editiors, Agha Ahmad Ali and Abdur Rahim, are identified as teachers (*modarresin*) of Madrasa Alia, Calcutta. The work was edited by collating ten different manuscripts, because each manuscripts consulted was tagged according to the first ten alphabets occurring in the *abjad* system of writing — *alef, be, jeem, dāl, he, wāw, ze, hā, tā* and *yā* — as referred to in the footnotes of concerned pages.

4 : Agha Ahmad Ali at the Asiatic Society : Compiling an original work in Persian

Besides editing Persian manuscripts, as discussed in the preceding section, Agha Ahmad Ali Ahmad had also compiled an original

work on the history of masnavi-writing in Persian language at the Asiatic Society under the title *Haft Āsmān,* which was published by the Society, with "A Biographical Notice of the Author" by Henry Blochmann, in 1873.

Before we discuss *Haft Āsmān,* I would like to go into the circumstances, under which the work was complied, the original plan of the work and the form in which it has come down to us.

4.1 : Background of compiling 'Haft Āsmān'

Regarding *Haft Āsmān,* Blochmann, in his Notice, referred to above writes in the following words :

> The *Haft Āsmān* is the last work of Agha Ahmad Ali. It was originally written as an introduction to Nizami's works, to accompany the Society's edition of the *Sikandarnāmah i Bahri*. It contains a valuable history of the Persian Masnawi. As Masnawis are written in seven metres, the work was entitled Haft Āsmān, or the 'Seven Heavens'.[48]

What Agha Ahmad Ali had written "as an introduction" to his edited text of Nezami Ganjevi's Persian Masnavi, *Sekandarnāme-ye Bahri* — which was published by the Asiatic Society of Bengal in 1869 and which I have discussed earlier (Section 3.4) — was actually in the form of "an essay", which the Society had intended to bring out separately as a continuation of the edited text of the masnavi, as it appears from the masnavi's title-page, which being in English, is reproduced below:

> Bibliotheca Indica: Collection of Oriental Works, Published by the Asiatic Society of Bengal, New Series, No. 171. The Sikandar Namah i Bahri by Nizami. Fasciculus II. Edited by Maulawi Agha Ahmad Ali, Calcutta Madrasah. *The Concluding fasciculus will contain an Essay by Maulawi Agha Ahmad Ali on the History of the Masnawi of the Persians and the Life and Writings of Nezami.* Calcutta: Printed by C.B. Lewis, at the Baptist Mission Press, 1869.[49]

Though such "an essay", as mentioned above, does not seem to have been published as "the concluding fasciculus" of Agha Ahmad Ali's edition of *Sekandarnāme-ye Bahri,* it was probably the same write-up that the Agha later on *developed* into a full-fledged book, entitled *Haft Āsmān* — in the introduction of which he elaborates that when, *after* the publication of his edition of *Sekandarnāme-ye Bahri,* the Society "desired" from him that a detailed history of masnavi-writing in Persian language, with special reference to Nezami Ganjevi's life and works, be compiled, he carried out exhaustive research on the subject by utilizing original sources and presented his findings in the form of a compilation to which, he says, he gave the title *Haft Āsmān* for the reason that it dealt with the *seven* metres in which Persian masnavis are written. The own words of the Agha, which I have rendered into English, are given below :

> "This humble self, Ahmad [Ali Ahmad], brings it to the notice [of the readers] that earlier the members of the [executive] committee of the Asiatic Society of Calcutta (*ahāli-ye kamiti-ye eshiyātik sosāyeti-ye kalkatte*) had published the first half of the second volume of [Nezami Ganjevi's Persian masnavi] *Sekandarnāme,* which is famous as [*Sekhandarnāme-ye*] *Bahri* in this country, and which was edited by Janāb Dr. Sprenger *Sāheb* and Agha Mohammad Shustari. This year, which is one thousand eight hundred and sixty-nine (1869) Christian era and one thousand two hundred and eighty-five (1285) Hijri era, the members of the above committee published the concluding half of that [masnavi] as edited by this humble self [Ahmad Ali Ahmad]. Afterwards (*sepas*), they desired [from me] that a biography of its (*Sekandarnāme-ye Bahri's*) illustrious author, Nezami Gangevi (May the mercy of Allah be upon him!), with some details about the masnavi — as to what it is, when it was written, who have written it, what are its metres and what have been its subjects, and in this connection, the description of his *Panj Ganj,* which is famous as *Khamse-ye Nezāmi,* and those [masnavis] which were composed

on its model — be compiled and published [in the form of a book]. Accordingly, I made thorough investigations into such memoirs as [Abdorrahman] Jami's *Nafahātol-Ons* and *Bahārestān;* Dowlatshah Samarqandi's *Tazkeratosh-Shoʻarā;* Mohammad Amin Razi's *Haft Eqlim;* Shir Khan Lodi's *Meraʼtol-khayāl;* Bakhtavar Khan Alamgiri's *Meraʼtol-ʻĀlam;* Mirza Taher Nasr-abadi Isfahani's *Tazkere;* Azar Isfahani's *Āteshkade;* Sarkhosh's *Kalemātosh-Shoʻarā;* and Azad Belgerami's *Khazāneye ʻĀmere,* which contains the accounts of those poets who were recipients of royal rewards (*sho ʻara-ye sahib-e sele*), besides such books as dealing with prosody and rhyme, and treatises on grammar and rhetoric, and other works on related subjects. I have put down my finding in these pages (*dar in owrāq, be tahqiqi ke moyassaram shod, sabt kardam*) and hope, by divine grace, that, like my [earlier work] *Resāle-ye Tarāne*, the present book will also be received well and judiciously, and as the metres of the masnavi are *seven* in number and as the book is actually to deal with them [all], I have given it the title *Haft Āsmān.*[50]

Now, if we read the above statement of Agha Ahmad Ali in the light of the information which is given on the title-page of the text of the masnavi, *Sekandarnāme-ye Bahri,* published by the Asiatic Society in 1869 and which I have reproduced above, it appears that the Agha had submitted to the Asiatic Society his edited text of the above masnavi, along with "an essay" on the history of masnavi-writing, with special reference to the life and works of Nezami, and while the edited version of masnavi was brought out by the Society in 1869, the "essay" seemed to have been kept preserved for publication as the "concluding fasciculus" of the work. It is quite certain that Blochmann — who was then the Philological Secretary of the Asiatic Society of Bengal[51] and who had also earlier helped Agha Ahmad Ali by having the latter's treatise on the metres of Persian ruba'i entitled *Resāle-ye Tarāne* (1866), "printed as a tribute of a pupil in 1867"[52] — had gone through that "essay" and found its theme to be quite suitable for a larger work. It was therefore, certainly

at the initiative of Bochmann that the Asiatic Society had requested the Agha to compile a detailed history of masnavi-writing in Persian.

In this connection, it is interesting to note that the "essay", referred to above, seems to have been the same that we find in *Haft Āsmān,* in the form of a prologue, under the caption "*auj*" (= zenith), because, in this prologue, he first speaks about those manuscripts he had used for editing the *Sekandarnāme-ye Bahri* and then, after describing the masnavi as a Persian verse-form and its origin and mentioning the different masnavi-writers, passes on to deal with the life and works of Nezami Ganjevi in details.[53] This prologue is followed by a lengthy text under the title *Āsmān-e Avval (*= First Sky), indicting the start of the first volume of the work.

4.2 : The original plan of 'Haft Āsmān'

The original plan of *Haft Āsmān,* that Agha Ahmad Ali had conceived was quite extensive, because masnavis — masnavi, being the name of a verse-form, is used for composing long narrative poems in Perssian — comprise a very large portion of classical Persian poetry and a through discussion on them would fill several volumes. Knowing it well, the Agha had decided to write his work in seven volumes — each volume dealing with one of the seven meteres in which Persian masnavis are generally written — and that is why he, as he elaborates in the above-quoted extract from his work, had named it *Haft Āsmān (*= Seven Skies*).*

Since the published version of *Haft Āsmān* comprises its first volume, which is called *Āsmān-e Aval* (= First Sky) and which deals with the metre used by Nezami Ganjevi in the *Makhzanol-Astrār,* it appears that the Agha had intended to write on the remaining six metres of Persian masnavis in the subsequent volumes, because, in the prologue of his work, he, while speaking of Naser-e Khosrow, says that the latter's masvavis, like *Sa'ādantnāme* and *Rowshanā-i-name,* will be discussed in the *Āsmān-e Sevvom*"[54] (= Third Sky), that is, in the third volume, and in the same way, while speaking of the famous Iranian masnavi-writer Thanāyi Mashhadi, the Agha says at one place in the

text of the *Āsmān e Avval,* that the latter "will be discussed in the *Āsmān-e Sheshom*"[55] (= Sixth Sky), that is, in the sixth voulume.

But, after completing the first volume, the Agha could not carry on his work because of his premature death in 1873, when he was merely 34 years of age.

4.3 : 'Haft Āsmān' as it has come down to us

Though *Haft Āsmān,* which has come down to us, is actually the first volume of the work, it "forms", according to Blochmann, "a whole and will be found to contain valuable hints on Persian poets and their works."[56] Blochmann's remark is true in the sense that the volume covers almost all those poets who had composed their Persian masnavis on the metre adopted by Nezami Ganjevi in the *Makhzanol-Asrār.*

The book's title's page runs, in free translation, thus: "This excellent book on masnavi and masnavi-writers, entitled *Haft Āsmān,* is the work of the leading researcher and the erudite scholar, *Janāb* Mowlavi Āghā Ahmad Ali Ahmad: printed by the orders of the Asiatic Society of Bengal, at the Baptist Mission Press, Calcutta, in the year 1873 A.D."

The book, which runs into 187 pages, opens with a prologue, under the caption "*auj*" (=zenith), in which Agha Ahmad Ali first defines the term *masnavi* and then traces the origin of masnavi-writing in Persian language, with special reference to Rudaki, whom he rightly calls *ādamush-shu 'arā,* or the father of (Persian) poetry. After giving a detailed notice of Rudaki and his celebrated Persian masnavi, *Kalile wa Demme,* [57] the Agha deals with those poets who followed Rudaki and composed masnavis, like Abu Shakur Balkhi, Daqiqi, Onsori, Asadi Tusi, Ferdowsi, Naser Khosrow, As'ad Gorgani, Mas 'ud Sad Salman, Sanayi Ghaznavi, 'Am 'aq Bokhari, Nezami Aruzi, Qatran Tabrizi and Fasihi Jorjani.[58]

After giving brief notices on each of above poets, Agha Ahmad Ali takes up the main chapter dealing with the life and works of Nezami Ganjevi.[59]

And then starts the *Āsmān-e Avval,* in which the Agha describes the metre adopted by Nezami in the masnavi *Makhzanol-Asrār,* with a long descriptive list of all those masnavis which were composed on the same metre and which are serially numbered by him as seventy-eight accompanied by specimens of their compositions in each case.[60] In this connection it is interesting to note that, in the list of these masnavis, the Agha had, at the end, included those too which were composed by Persian poets belonging to Bengal, particularly Calcutta, such as *Tāj-e Sokhan* by Abdur Rauf Wahid, who is described as "illuminating the poetic get-together in this city [Calcutta] today"; *Mashreqol-Anwār* by Obaidullah Obaidi, who is described as "one of the great poets of Midnapore"; and *Chāre-ye Bimār* by Abdul Halim 'Āsem, who is described as "one of the disciples of this humble self [Agha Ahmad Ali]" and "one of the budding poets of this city [Calcutta]".[61]

In the concluding portion of *Āsmān-e Avval,* Agha Ahmad Ali shows how the different poets had used *bismillah* in the opening hemistich and then explains why the meter adopted by Nezami in *Makhzanol-Asrār* had been one of the most popular meters for masnavi-writing in Persian in later period.[62]

5 : Conclusion

In the light of the discussion made in the preceding sections, it may be said that the works done by the Dhaka-born Persian scholar, Agha Ahmad Ali Ahmad (1839-1873), at the Asiatic Society in Calcutta, where he had spent the last decade of his short 34-year life, are of scholarly value, because they comprises not only the edited texts prepared by him of a number of Persian manuscripts of literary and historical importance, like *Wis o Rāmin, Iqbālnāme-ye Jahāngiri, Muntakhabut-Tawārikh, Sekandarnāme-ye Bahri, Ma'āthir-i-'Ālamgiri* and *Akbarnāme,* but also the original text of a research work compiled by him on the history of masnavi-writing in Persian language, under the title *Haft Āsmān,* which is a unique work on a subject that doesn't seem to have been ever undertaken even in Iran.

Notes

[1] The Calcutta Madrasa, which was established by the Governor General, Warren Hastings, in 1781, has, since 2008, been a state university, designated as the Aliah University.

[2] Since the establishment of the Asiatic Society by Sir William Jones at Calcutta in 1784, its name had undergone a number of changes, such as The Asiatick Society (1784-1825), The Asiatic Society (1825-1832), The Asiatic Society of Bengal (1832-1935), The Royal Asiatic Society of Bengal (1936-1951) and The Asiatic Society again since July 1, 1951 (*The Asiatic Society Bicentenary Souvenir: 1784-1984*, The Asiatic Society publication, 1984, p.1).

[3] For an account of these works, see M. Firoze, "Agha Ahmad Ali Ahmad: A Persian Scholar of Nineteenth-Century Bengal", *Indo-Iranica* (journal of the Iran Society, Kolkata), Vol. 59, Nos. 3-4 (September-December 2006), pp. 49-62.

[4] Agha Ahmad Ali himself says that he is by origin "*Isfahāni*", (= 'of Isfahan'), and by birth "*Jahāngir-nagari*" (= 'of Jahangir-nagar', which is the old name of Dhaka). [Agha Ahmad Ali, *Mo'ayyed-e Borhān*, Calcutta, 1865, p.1].

[5] Born at Dresden, Blochmann (1838-1878) spent most of his career in Calcutta, where he worked first as an Assistant Professor of Arabic and Persian at the Calcutta Madrasa and then as the Principal of the Madrasa, and is remembered for his translation of Abul Fazl's *Ā'in-e Akbari* from Persian into English. (https://en.wikipedia.org/wiki/Heinrich_Blochmann)

[6] Agha Ahmad Ali Ahmad, *Haft Āsmān*, with "A Biographical Notice of the Author" by H. Blochmann (which I will henceforth refer to as: *Haft Āsmān*, English Section), p. iii.

[7] Mohammad Abdullah, *Bānglādeshe Fārsi Sāhitya: Unobingsha Shatabdi*, Dhaka, 1983, p. 131.

[8] Wafa Rashedi, *Bangāl mein Urdu*, Hyderabad (Pakistan), 1955, p. 46.

[9] *Haft Āsmān*, English Section, p. iii. The *tārikhi* name of a person is the name which contains the *tārikh* or chronogram pertaining to the date of the birth of that person and the date comes out when, according to the *abjad*-system of calculation, the numerical values of the letters comprising the name are added together. (For the *abjad*-system of calculation, see Zahra Khanlari, *Farhabg-e Adabiyāt-e Fārsi-ye Dari*, Tehran, 1969, p. 181).

[10] As per the calculation, based on the table of conversion from A.H. to A.D., compiled by Abu Nasr Mohammad Khaledi, *Taqwim-e Hijri wa 'Isawi*, Delhi, 1977.

[11] Abdus Sattar, *Ta'rikh-e Madrasa-e Āliya-e Kalkatte*, Dhaka, 1959, p. 184.

[12] *Haft Āsmān*, English Section, p. iii.

[13] *Divān-e Āzād*, Azimabad (Patna), 1307/1889, pp. 11-12. For an account of Mahmud Azad's appreciation of Agha Ahmad Ali's scholarly and poetic

excellence, see M. Firoze, *Mahmud Āzād: A Persian Poet of Nineteenth-Century Bengal*, Iran Society publication, Kolkata, 2014, pp. 36-37.

[14] Abdullah, p. 131.

[15] *Haft Āsmān*, English Section, p. iii; Abdullah, p. 131.

[16] Abdus Sattar, p. 184. Abdullah, p. 132.

[17] It is interesting to note that it was during his stay in Calcutta, that Cowell discovered a manuscript of Omar Khayyam's Persian quatrains in the library of the Asiatic Society and sent a copy to his friend and student, Edward Fitzgerald, who produced the metrical translation of those quatrains under the title *Rubaiyat of Omar Khayyam*, which was published at London in 1859. Cowell also published, unsigned, an introduction of Khayyam with a translation of thirty quatrains in the *Calcutta Review* in 1858. (https://en.wikipedia.org/wiki/Edward_Byles_Cowell).

[18] *Haft Āsmān*, English Section, p. iii.

[19] Lees had been the Principal of the Calcutta Madrasa from 1857 to 1870 (M. Rahman, *History of Madrasa Education*, Calcutta, 1977, p. 234.)

[20] *Haft Āsmān*, English Section, p. iii; Abdus Sattar, p. 184; Abdullah, p. 132.

[21] Abdus Sattar, p. 184.

[22] *Ibid.*, pp. 184-185.

[23] M. Rahman, pp. 282-283; Abdullah, p. 132.

[24] Malik Ram, *Zikr-e Ghālib*, New Delhi, 1976, pp. 63-66.

[25] For details, see Kalim Sahsarami, *Bangāl mein Ghalib-Shenāsi*, Dhaka, 1990, pp. 40-47.

[26] *Haft Āsmān*, English Section, p. iv.

[27] As per the calculation, based on the table, referred to in fn. 6.

[28] *Haft Āsmān*, English Section, p. iv.

[29] *Ibid.*, English Section, p. iii. (As the titles of the works are not given in italics in the original, I have maintained the same format with the same spellings in this extract).

[30] E. G. Browne, *A Literary History of Persia*, Vol. II, Cambridge, 1906, p. 274.

[31] Wladimir Ivanow, *Concise Descriptive Catalogue of the Persian Manuscripts in the Collection of the Asiatic Society of Bengal*, Asiatic Society publication, Calcutta, 1924, reprint 1985, Manuscript serial No. 429.

[32] As pointed out by Wladimir Ivanow, *op. cit.*, p. 191.

[33] Fakhroddin As'ad Gorgani, *Wis o Rāmin*, ed. Agha Ahmad Ali, The Asiatic Society of Bengal publication, 1864, Text, p. 4.

[34] *Wis o Rāmin* — Editions: ed. M. Minovi, Tehran, 1314/1935; ed. Moḥammad Ja'far Mïjub, Tehran 1337/1959; ed. by A. Devonaqulov, Dushanbe, 1966; ed. M. Todua and A. Gwakharia, Tehran, 1349/1970. Translations: Eng. tr. by G. Morrison, New York, 1972; French tr. by H. Massé, Paris, 1959; Russian tr.

by S. Lipkin, Moscow, 1963; Georgian tr. (11th century C.E.), called *Visramiani,* by S. Tmogveli, Moscow, 1938; Eng. tr. of the Georgian version, by Oliver Wardrop, London, 1914, reprint 1966. (http://www.iranicaonline.org/articles/vis-o-ramin)

[35] Motamed Khan, *Iqbālnāme-ye Jahāngiri*, ed. Maulavi Abdul Hai and Agha Ahmad Ali, The Asiatic Society of Bengal publication, 1865, Text, pp. 67, 250, 251 *et. passim.*

[36] Abdul Qadir Badayuni, *Muntakhabut-Tawārikh*, Asiatic Society of Bengal publication, Calcutta, 1865, Persian Text, Vol. I, p. 32fn.

[37] *Ibid.*, Vol. I, p. 35fn.

[38] *Ibid.*, Vol. I, p. 37.

[39] Browne, *op. cit.,* Vol. II, pp. 400-401.

[40] *Ibid.*, Vol. II, p. 411.

[41] Alloys Sprenger (1813-1893) had been in Calcutta from 1851 to 1854, serving as government translator as well as the Principal of Calcutta Madrasa and of the Mohammadan College at Hoogli. He had also been one of the Secretaries of the Asiatic Society of Bengal and remained its Honorary Member till his death. [https://en.wikisource.org/wiki/Sprenger_Aloys_(DNB00)].

[42] Saqi Musta'id Khan, *Ma'āsir-i-'Ālamgiri*, Translated into English and Annotated by Sir Jadunath Sarkar, Royal Asiatic Society of Bengal publication, Calcutta, 1947, p. 10 fn.

[43] Saqi Musta'id Khan, *Ma'āthir-i-'Ālamgiri*, ed. Agha Ahmad Ali, Asiatic Society of Bengal publication, Calcutta, 1873, Persian Text, p. 292

[44] *Ibid.*, p. 334

[45] *Ibid.*, pp. 29, 39, 176, 180, 268.

[46] *Ibid.*, p. 510.

[47] *Ibid.*, p. 268 fn.

[48] *Haft Āsmān*, English Section, p. iv. As the titles of the works are not written in italics in the original text, I have retained the same in the extract here.

[49] The words in italics are as in the original.

[50] *Haft Āsmān*, Text, p. 2.

[51] Blochmann, who was appointed the Principal of Calcutta Madrasa in 1875, had also been the Philological Secretary of the Asiatic Society of Bengal from 1868 till his death in 1878. (http://www.iranicaonline.org/articles/blochmann-heinrich-henry).

[52] *Haft Āsmān*, English Section, p. iii. The title-page, in English, of *Resāle-ye Tarāne* runs thus: "A treatise on the Rubāi, *Risālah-i-Tarānah*, by Agha Ahmad Ali, Persian Teacher, Calcutta Madrasah. With an Introduction and Explanatory Notes by H. Blochmann, M.A., Printed by J. Wenger, Baptist

Mission Press, Calcutta, 1867."

[53] *Haft Āsmān*, Text, pp. 1-52.

[54] *Ibid.*, p. 17.

[55] *Ibid.*, p. 117.

[56] *Haft Āsmān*, English Section, p. iv.

[57] *Haft Āsmān*, Text, pp. 6-12.

[58] *Ibid.*, pp. 11-24.

[59] *Ibid.*, pp. 25-52.

[60] *Ibid.*, pp. 52-171.

[61] *Ibid.*, pp. 168-171. Wahid, who was born in Calcutta in 1828 and died here after 1891, was a celebrated Persian scholar and poet, having to his credit more than a dozen books in prose and verse, and had earned the honour of being the Fellow of the University of Calcutta in 1889. (For an account of his life and works, see M. Firoze, *Wahid: A Persian Poet of Calcutta in the Nineteenth Century*, Iran Society publication, Kolkata, 2012, pp. 38-85). Obaidi (1834-1885), who was born at the village Daspur in the Midnapore district of Bengal, spent a great part of his life in Calcutta and served for some years as a Professor of Arabic at the Hugli College (the present Hooghly Mohsin College), was a great Persian scholar and poet, having to his credit a number of books in Arabic, Persian, Urdu and English, including *A Grammar of Arabic Language*, a revised edition of which was published by the University of Calcutta in 1939. (For an account of his life and works, see M. Firoze, *Obaidi: A Persian Poet of Nineteenth- Century Bengal*, Iran Society publication, Kolkata, 2005, pp. 21-49).

[62] *Haft Āsmān*, Text, pp.171-174.

THE PUBLIC LIFE OF A LAW REPORT

SUKHALATA SEN

Introduction

The transition of a lawyer to a public figure is a cliché in modern society. This imagination cleaves law and state into distinct authority, where law works as a restraint to the aggrandising impulses of the state. Here law is beholden to the civic society and against the monopolistic claims of the state. Though such an imagination offers a limited understanding of the functioning of the state, it nevertheless tells us of a belief, of generations raised in the belief, that law and civic society were almost endogamous. My aim is to return to the colonial period of early twentieth century where such transitions were most common, yet plunged the lawyer into a deep identity crisis. This essay will recount the crisis of a lawyer, raised in the belief of the justice of law, ironically introduced by the alien society, and the commitment he had towards to his Indian civic society.

The Editor

There is very little evidence to reconstruct the life of the editor, Jogesh Chandra Chaudhuri. There is no personal documents or proper recognition of his presence in the leaves of history. Yet he was no mean personage in history of nationalism in India. The only acknowledgment I stumbled across of him, was as a talented editor of the *Calcutta Weekly Notes* (CWN). Hence we may perhaps begin at this point, that the identity of the man was inextricably linked with his publication, and his recognition in the Indian affairs came only after his publication of the *Calcutta Weekly Notes.*The voice of the law report was therefore to be significant, to amplify his thoughts and his position on matters of legal and national importance. Apart from the law report itself, we seldom find the voice of the man coming to the fore. His grandson, who now runs the law report speaks of its lost grandeur, and relives brief memories of a distant grandfather. The

law report, that had in the course of the years, turned into a leading law report in Calcutta, now awaits a silent but unsurprised death with the inevitable demise of the grandson. The grandson, however has much more to tell about the law report. Built from the fame of the law report, a college for law in the name of the editor was established at Prince Anwar Shah Road. The college it appears has outlived the law report. There was a wrestle for space between the Communist Party of India backed Kolkata Municipal Corporation and CWN resulting in CWN shutting down its production unit in the 1990s. The property was lost to the Municipal Corporation. It is of no surprise, therefore, that the college bred anti-CPIM tendencies, a haven for Trinamool Congress Chatra Parishad (Students Union), which triumphs till date. In the elections of Jogesh Chandra Law College, Students Federation of India struggled to gain a foothold for the thirty years of CPIM rule. The legacy of the law report, the belief of the legal-civic society against the state, appeared to have shifted to another form, from a law report to a college.

How are we to then confront his forgetting from public memory, and even in the college itself? Perhaps the belief that he grew up with became obsolete to a society, or to a profession,that had since then gained independence from the Raj, settled its identity crises, battled against the Emergency and benefitted from the rise of globalization, where civic society now expanded beyond the national frontiers. Here my remembering of the man, is to return to a time that was more cloistered, where movement was more restrained, opportunities for the *bhadralok* class more limited, and ideologies more uninhibited. Through this essay I propose to study him as a typical lawyer of the time, bound by a sense of duty to his Indian civic society and wishing to realise it through the law. I wish to return to recreate Jogesh Chandra Chaudhuri, a quiet and energetic man, perhaps overshadowed by his more celebrity siblings. The remembering of the man is particularly difficult, a reflection of his private, quiet self— some snippets of information occasionally in a memoir, a short paragraph in a Who- is-Who edition, a brief reference in an autobiography of his more famous brother— pieced together here to render a ghost of a man.

Jogesh Chandra Chaudhuri was the second child of a wealthy zamindar from Haripur in the district of Pabna, (now in Bangaldesh), born on June 28, 1862. He was born to Durgadas Chaudhuri and Sukumari Debi, who had descended from the family of Basanta Ray, one of the twelve Bhunyiyas of Bengal. Durgadas had from a very early start established a very catholic atmosphere towards religion and education in his home.[1] Consequently the five brothers grew to be polymaths, well versed in French, English, Bengali and Persian, with varied interests in poetry, law, politics, science, and atheism. It is said, that Durgadas had once been slighted by a British official who thought he came for a job for one of his sons. On that day, he resolved to send his sons to England to become barristers as that was the most respectable profession in which one did not have to serve the British.[2] All his five sons, thereafter, grew to be barristers but all did not pursue the law. Ashutosh Chaudhuri, the eldest, was later knighted, became a judge of the High Court of Calcutta; Pramatha Chaudhury chose to be a famous Bengali litterateur, Kumud Nath Chaudhuri, more famous as a hunter than lawyer, and A.N.Chaudhuri, one of the most famous anglicised barrister of time, briefly prosecuted in the famous Bhawal Sanyasi Conspiracy case.[3] The brothers grew ingrained in the belief that law was the profession of 'respect', for the free spirited and the educated mind.[4] The establishment of CWN itself, in a form and space hitherto inhabited by British barristers, was in a sense both a private effort at improving the lot of Indian legal practitioners, and an undercurrent of Jogesh Chandra's nationalist sentiments. Despite his reformist attitude, he did not choose Bengali as a vehicle for his law report. Though the readership in Bengali would have undoubtedly been more, Jogesh Chandra chose English because it was the language of 'respect', in which the law was enframed, and because it was characteristic of men of his time, who distinguished themselves from their countrymen by their capacity to understand, negotiate and operate the spaces, and processes of a representative of the 'new India' being created by the British rule.[5] The translation of the British principles of rule of law confronted directly with the colonial situation. *The Calcutta Weekly Notes*, became the embodiment of this dilemma of a belief in the law that could

render justice for the greater good, and a desire to ingratiate himself to the legal profession, risen on the rubrics of colonial intervention.

Jogesh Chandra, did not begin his journey from law. He first completed schooling from Krishnagar Collegiate School, then joined Presidency College for a while, left it for his younger brother Pramatha who was convalescing from a severe illness. He returned to Calcutta and completed his Bachelors in Physics from St. Xaviers College, his Masters from Calcutta University and then in 1886 was appointed by Iswar Chandra Vidyasagar, the lecturer in Physics and Chemistry in Metropoliton College, now Vidyasagar College.[6] Thereafter, he went to England to pursue natural science in New College, Oxford and enrolled himself as a Barrister in the Inner Temple.[7] When he returned, Jogesh Chandra joined the Calcutta High Court in 1895, and a major case was being tried in the Bombay court that affected the civil society directly. Immediately, he accompanied Sir P. L. Pugh to Bombay to defend Balgangadhar Tilak in his first sedition trial case for *Kesari*.[8] The matter was reported in the *Calcutta Weekly Notes,* with much evocative rhetoric. However, to save from the wrath of government censorship, the law report pledged to remain a political, concerning itself with discussions on legal matters and system of British justice. Meanwhile, their close association with the Tagore Family had rendered the Chaudhuri brothers more Reformed Hindus and Swadeshists.[9] This association affected the public lives of the family. While his elder and younger brother, Ashutosh and Pramatha, flourished their literary skills, Jogesh Chandra instead grew motivated to a journalistic career which found manifest in the *Calcutta Weekly Notes.*

The *Calcutta Weekly Notes*, was no ordinary law report. Most law reports preceding it was merely a compilation of the cases listed according to the courts of hearing and subjects of the hearing. In 1896 he CWN, broke into this dismal world of mere listing cases, with a journalistic reportage on legal themes in the world of the High Court. This ensured Jogesh Chandra much desired space where he could report legal grievances of the community as well as his 'secret nationalism' under the legal veneer. One such moment where his carefully schemed law report picked mileage in the civic society, was at the time of dismembering of Bengal Presidency in 1905. The

translation of rule of law was aided by co-authorship of men like Jogesh Chandra, who aimed to find suitable meaning of the colonial law at a time when the law became the implement of assault.

Public Moment of the Law Report

The plans for a division of the Bengal province had begun its early murmurs in 1896. The Chief Commissioner of Assam, William Ward had proposed the division of Mymensingh district into two, and the attachment of the Chittagong division to the erstwhile Assam.[10] This proposal was revived by the Lieutenant Govenrnor of Bengal, Sir Andrew Fraser in his note of 28 March 1903 and finally accepted by Curzon.[11] On 3 December 1903, Risley's letter announcing the partition scheme was made public, deeming it necessary on four grounds: first, that Bengal with a population of 78.5 million was too vast for administration by the Lieutenant Governor, secondly, for the improvement of the port of Chittagong, then that the eastern Bengal was imperfectly supervised and the incapacity of Assam to pay for its own development. Further it was also stated among the reasons: "the spread of education and the wider diffusion of the Native Press tend to increase litigation, to demand more precise methods of administration, to give greater publicity to the conduct of officials, and in every way, to place heavier strain upon the head of the Government and upon all ranks of its subordinates".[12] The partition of Bengal, as argued by colonial authorities,was an outcome of the excessive civic sense of the people residing in the presidency.This was in direct conflict with men like Jogesh Chandra, raised in the habit of the usefulness of the Indian civic sense, and were beneficiaries of this civic sense in their professions who often went to court to address such civic problems. To claim their efforts as a reason for partition propelled them head first into an identity crisis.

The 'native' newspapers reacted in defence. Curiously, we find the same line of argument used earlier against the newspapers on the eve of 1878, again being re-circulated to serve a new cause, the partition of Bengal. The newspapers reacted by showing that proportion of civil or criminal litigation in Bengal was lower than in other provinces as indicated below:[13]

Courts	No. of civil cases per thousand of population	No. of criminal cases per thousand of population
Bengal	8.8	24
Bombay	10.4	103
Madras	9.1	80
United Provinces	11.4	26
Punjab	12.2	45

The High Court of Calcutta confronted the administrative problems that could result from such a scheme :

> "…in Sylhet, these officers are, as it were, borrowed from the province of Bengal; and after a certain period of service under the Government of Assam, they revert to Bengal. If this system is to apply to the districts proposed to be transferred, the Judges fear that they would suffer from transfer, as the provinces of Bengal will not willingly lend the best and most experienced officers; and the civil judicial agency would thus deteriorate."[14]

It further expressed its reservations against appointing military men as magistrates of the districts and commissioners of the new province, and the difficulty of having a separate judicial service in Assam where very few appointments were available.[15] Meanwhile, a Swadeshi pamphlet doing rounds, informed that there was already a problem of overcrowding. In a single East Bengal district of Madaripur, there were as many as eighty pleaders, making the *bhadralok* class more dependent on petty zamindari or intermediate tenures which subdivided for inheritance, had become progressively less remunerative.[16] The bigger zamindari class such as Jatindranath and Sourendra Mohan Tagore, who owned property on both sides of the Brahmaputra, expressed concerns for appointing two sets of pleaders and agents for questions before the Commissioner of the new province and those which would go to Board of Revenue of Calcutta.[17]

When Jogesh Chandra intervened in his *Calcutta Weekly Notes*, he was venturing into a general distrust about the legal ramifications of the scheme. He further expanded the logic of protest through a

proposition of illegality of the partition circulated in CWN. Unlike his contemporaries, he chose to translate the meaning of this divisive law in a language that was intelligible both to his Indian community and the imperial administrators.

He carefully rummaged through the old statutes and argued that in 1833 the Statute 3 and 4 of Fort William, section 85 and section 38 directed that the territories subject to the Government of Fort William in Bengal was to be divided into two Province, one to be called the Presidency of Fort William and the other called the Presidency of Agra. The section 56 further provided that these Presidencies were to have Governor and Councils similar to Madras and Bombay. But the scheme for two provinces was kept suspended and instead a Lieutenant Governor for the North Western Province was appointed on a temporary basis. In 1853 another act again confirmed this separation and by Statute 16 and 17 provided that Governor General in Council would cease to be Governor of Bengal; and that a separate Governor of Bengal was to be appointed in his place. Finally in 1861 by the Indian Councils Act, section 24 and 25 stated that the Governor General in Council had no power to repeal or amend the provisions of the Statute 16 and 17 of 1853. The editor hence concluded that the Governor General had no authority to change the boundaries of the Bengal presidency, and even if the boundary was to be changed, it was certainly not to be carved out from its eastern half but rather from the north western half as stipulated by statutes of the Parliament. Further, he argued that under the Statute 1865 any portion of territories under Chief Commissioner could be transferred to a Presidency or Lieutenant Governorship but the converse could not happen.[18] He therefore declared the Partition of Bengal to be an illegal act.[19]

The circulation of this new meaning of law was quickly seized by vernacular newspapers in their protestations against the partition of Bengal. In 1904 the Indian Association began to spout this new logic in their meetings. They further gave 'precedents' to this statement; that while Curzon might have opposed the idea that office of Lieutenant Governor was a temporary arrangement, men like Charles Stevens, Sir Charles Elliot, Sir Anthony Macdonnell were in favour of it being so.[20] The Bengal Chamber of Commerce too, began quoting the *Calcutta Weekly Notes* in a letter dispatched to the government :

> There is a risk, as pointed out by the talented editor of the well-known journal, the *Calcutta Weekly Notes*, of the whole of the criminal administration in the ceded districts being changed at the pleasure of the Chief Commissioner. For section 30 of the Criminal Procedure Act empowered the Chief Commissioner of Assam to allow any Magistrate of the first class, to try all offences which were not punishable by death.[21] Section 34 of the same Code empowered such Magistrates to pass sentences of imprisonment or transportation up to seven years. After this it would be an anomaly to say that the law, the administration of justice, the form of government will remain the same…[22]

The new legal point was noted in the secret correspondences of the government.

> …the legal point is mentioned in the *Calcutta Weekly Notes* for 1904…The Bengali papers are now raising the question of legality of the Government's action in forming the new Province and they are talking of suit in the High Court, the idea being apparently to delay matters until a Liberal Government comes into power, when it is hoped that the Secretary of State's sanction may be cancelled.[23]

But this legal point became more than just popular. Riding on the crest of this innovative counterpoint to the partition of Bengal Presidency, in 1907, Jogesh Chandra found a place in Indian Association which pledged to be, "by our younger, well educated countrymen."[24] This was an open acknowledgement of the civic organisations to the contribution of Jogesh, for saving their world belief. Jogesh Chandra, in a few years became a member of the Executive Committee of the Association and in 1926 he became one of the office bearers for the Committee.[25] The enrolment to this association was not too unnatural if we consider the composition of the Indian Association. In 1880 the Association had twenty members for its Executive Committee, of which fourteen were legal practitioners; three attorneys, five pleaders and four Barristers in the High Court of Calcutta and two pleaders from the district courts.[26] The Indian Association further did not confine its delegates to Calcutta and sent them to different parts of the country to spread the objectives of the Association.[27] Consequently, we see

Jogesh Chandra heading the Rajshahi branch of the Indian Association. The enlistment into the Indian Association, one of the most premier civic organisations of Indians, brought him in contact with his future mentor and inspiration— Surendranath Bannerjee. This association was later cemented into a familial relationship when Jogesh Chandra married Surendranath's third daughter, Sarasibala Bannerjee.[28] The strength of this union with Surendranath Bannerjee, propelled his 'secret nationalism' to flourish. He openly suggested an apparently more defiant stance against the Partition- a Swadeshi exhibition of Indian Industrial activity. But this step was not so defiant.Jogesh Chandra dutifully remembered that it was the British governance who had taught the Indians the lessons of industrial activity and its associate modernity. It was not surprising to find that the organizers at first approached the British government to patronise the event:

> J. C. Chaudhuri may be regarded as a pioneer of industrial movement in India. He suggested (and I cordially supported his recommendation) that there should be an Industrial Exhibition in connection with Congress... We appealed to the government for help, and I personally requested Lieutenant Governor, Sir John Woodburn, to open the exhibition. I represented to him that it was a purely industrial movement, that an Englishman like Woodroffe,(Advocate General),had joined it, and that the government might lend it their moral support by opening the exhibition. Such was the official attitude with regard to the Congress movement in those days that Sir John Woodburn didn't see his way to complying his request. He said, 'Mr B., after all, your exhibition is an annexe of the Congress. The political flavour is strong in it. I am sorry I cannot undertake to open your exhibition.' The function was performed by Maharaja of Cooch Behar in a neat little speech."[29]

The exhibition of 1905 had over one thousand registered exhibitors, over twenty two acres displaying of handloom industry.[30] The Exhibition was sponsored by renowned dissenters of the time to the Partition scheme— Jatindranath Tagore, the Roys of Bhagyakul, Peary Mohan Mukherjee. In the inaugural speech of this exhibition, Jogesh Chandra, now a fairly public figure, hoped that it would be "full of

lessons and suggestions to the Indian People and also to the outside world".[31] The lesson that Jogesh Chandra hoped the imperial government would learn is the Indian civic society too were a part of this modernity, while protesting against the aggrandisement of the imperial state. For men like Jogesh Chandra, modernity was already scripted in advance. As Sudipta Kaviraj points out, for the Indian leaders, the British model of modernity, with its parliamentary form of statehood, industrial economy, and rule of law were the only way the modernity was to be imagined.[32] Yet at this juncture we notice a co authorship of the notions of modernity. The colonized, by brandishing their potential in industrial activity was hoping to arrive at a language of equivalence with their colonized masters, by hoping it would also render them 'civilized' enough, was inadvertently translating modernity in more meaningful ways for the Indian community.

Meanwhile, the imperial government dismissed such charges of illegality of the Partition as circulated by the *Calcutta Weekly Notes*. The section 22 of the Indian Council's Act, it opined, referred to only the legislative powers of the Governor General in Council and was not a bar for the Governor General to declare partition by a proclamation by the section 46 and 47 of the same statute. In a letter from W.H.Macpherson, the Officiating Secretary to Government of Bengal, he wrote:

> It is not by any means clear that there is any tendency in administration by a Governor General towards bringing the Government more in touch with the people, or towards enabling it to overtake more work. The advantages of a Council to a Governor who has no knowledge of the Indian affairs may be real, but …would not tend…either to increase of efficiency or to easy and prompt discharge of public business.[33]

Further laying rest to allegations of an executive conspiracy to break up the jurisdiction of the High Court, he confirmed the jurisdiction of the High Court would prevail throughout Assam. However, in a letter published by Lord Curzon, dated 2 February 1905 he did not rule out the possibility of another court in Dacca. The logic here was now inverted, it would aid in the expansion of the legal

society where, "strong bar will certainly rise, having by that time developed a provincial spirit, may have an Appellate tribunal of its own and may not be inclined to favour the suggestion that Calcutta High Court should be expanded to the extent necessary to enable, to do the work of both the provinces"[34].

The CWN in response gathered the concerns of all other Indian led civic organisations bound to be affected by the partition scheme. His law report found representations of the zamindari and the commercial lobbies against the scheme. He published the memorial of the Bengal Chamber of Commerce seeking to clarify whether the strength of the High Court in future would be compromised:

> …the Committee… ventured to go to length in asking about the definite guarantees should be given for maintenance of jurisdiction of Calcutta High Court over transferred districts. Had the procedure of Government admitted of the new province being created by the Act of Legislature, the Committee would have suggested the inclusion of safe guarding the position of the [High] Court. But the new province is created by a Resolution; that such procedure is different matter for His Excellency Governor General in Council to bind his successors in office to any particular line of action[35].

More reports were published from the Calcutta Press, the Trade Association of Calcutta, and the Marwari Association who had objected strongly to this measure. But his reporting was silent on the assenters to the proposition of Partition. The Jute Mill lobby had no objections to the scheme. In a letter to the Bengal Chamber of Commerce, later forwarded to Government of Bengal, they confirmed that the scheme would not cause havoc to their business and hence had no opposition to the measure.[36] The Indian Mining Association too did not have strong objections against this scheme but only suggested for sake of business, the name Assam to remain unchanged.[37] The Tea Association of Assam also registered their assent to this proposal provided, provided that the name of Assam remained unaltered. If the province had to be renamed, they suggested 'Dacca and Assam' for the sake of convenience.[38]

Let us turn to Jogesh Chandra's own private opinion on the partition. His opinion now no longer remains cloistered but finds

expression in the pages of the law report. He viewed the partition as an act of betrayal, shoved 'behind the back of the Lordships', which invariably could only spell more confusion particularly in land laws.[39] Since the partition would cut across several agricultural holdings, and homestead lands, it would render the Judges in a spot to determine the cases by laws preceding the partition or the laws after the partition.[40] Apart from the legal overlap in cases and the consequent appointment of two sets of practitioners for the same case, we may read a more distressing concern underlying such lamentations. The CWN, by publishing the concerns of the moneyed and the legal profession, raised on the rule of law, was hinting at the catastrophe in both material and metaphorical terms if the law fell through.For Jogesh Chandra himself, practicing in the Pabna Bar, Partition would have spelt ruin, as for many other practitioners like him, who had many of their clients in what was to be the north eastern province.

But the partition scheme had to have a wider appeal. When Mr.Risley's letter dated 3 December 1903, proposing the partition was made public, he wrote scathing response in the *Calcutta Weekly Notes:*

> "Mr.Risley, surely does not contemplate creating a new ethnological phenomenon by making the people of the Eastern Bengal abandon their mother tongue by a mere shifting of the geographical boundary…The ethnologist secretary of the Government of India cannot expect that these 11 millions of people could ever be made to give up their language and literature by virtue of some future notification in the *Gazettte of India* for some fanciful administrative convenience."[41]

The partition of Bengal was therefore projected as an assault on the legal as well as the cultural roots of Bengal. As the notes section began to fill up more and more on the Partition, it began to lose its arbitrary news format and seemed to have a single recurrent theme running through its sections. The pages of *Calcutta Weekly Notes* became for a very brief period, a crucible of the legal and the emotive responses, promoting an idea of nationhood, that Bengali language was the key to unison, and Bengal united is power.

A Retreat from the Spotlight

If the *Calcutta Weekly Notes* was vociferous in the condemnation of the law at a time of Bengal Partition, in the later years we find its voice more subdued in its protests. The Incitement to Offences Act (Newspapers) in 1908 and the Press Act of 1910 were covered in the law report with markedly lesser energy and spirit.

In the coverage of these two acts, we are not overwhelmed by the presence of Jogesh Chandra, serving as the translator of the colonial law. Till 1913 there were 208 prosecutions under the Press Act, the busiest being the year of 1913, when there were 77.[42] We may suppose that Jogesh Chandra was toeing the line of caution to enable the circulation of his publication. But Jogesh Chandra had another reason to be more careful in his approach. By 1907 he had become a member of the Bengal Legislative Council and could not engage in such vociferous critique of the legislations. Instead we find a different strategy employed in the coverage of the Acts. The *Calcutta Weekly Notes,* meticulously recorded every case that succumbed under the purview of these Acts.

The first application of the Press Act fell upon an unwitting editor of a journal entitled *Comrade*, who was sent a legal notice for publishing seditious material. The seditious publication was in fact a translation of a pamphlet originally authored by Le Comte de Pub, written in French and then translated into English. The magistrate not only asked him to pay forfeiture for the publication of this pamphlet, but also demanded the surrender of all 23 copies which the editor had in his possession. The Magistrate failed to give reason for this order, but the order stated that "the words of the nature described in section 4, sub section 1 of Press Act 1910 inasmuch as they are likely to bring into hatred or contempt certain classes of subjects in British India."[43] When the matter was appealed in the High Court of Calcutta, the judges were uncertain whether the flow of the words were intended to cause public unrest. On the grounds of this ambiguity they found nothing decisively seditious in the contents of the pamphlet. But judges of the High Court had no jurisdiction to turn back an order passed by executive. Its function, the Judges haplessly observed, was limited to

the considering whether the book forfeited actually fell within the purview of the provision.

Contrary to this judgement, in another case reported from the Madras High Court, a different view was upheld. The famous case of the *New India,* under the proprietorship of Annie Besant, was brought to the Madras High Court, where she challenged the order of forfeiture by the Presidency Magistrate, which had been previously dismissed by him. The judges of the Madras High Court, unlike those of the Calcutta High Court, however differed on the section 4 of the act which determined the seditious quality of the tracts. Though they could not find evidence to prove that the natural flow of words was seditious, the Madras High Court unlike the Calcutta High Court, adjudged that this did not give enough reason to disregard the opinion of the Presidency Magistrate as baseless. This disunity in the verdict of the judges, impeded the translation of the law in the meaningful terms for the Indian community. Jogesh Chandra, pained yet dutiful, attempted a clarification in *Calcutta Weekly Notes:*

> Let us assume keeper refuses? What would be the consequences? Under section 23, he will be convicted and sentenced to heavy fine and imprisonment. Viewed in this way, the exercise of the Magistrate's power, however summary may be, cannot be regarded as any other than judicial.[44]

The *Calcutta Weekly Notes* published more cases that proved the risks of letting magisterial power decide a case to be seditious. In one case the Magistrate of Chief Court of Punjab used his authority to brand the editor of the *Punjabee* as seditious, who published a story alleging a European had murdered his Indian peon. Jogesh Chandra, wrote in despair that 'where one would have thought this section would be evoked to contain those elements that caused bad blood between Muslims and Hindus, it was used instead to cover grounds where a normal defamation suit would do.'[45] The Judges of the Calcutta High Court had opined on the section, that it was just not enough that the possibility of causing fear and alarm in the public mind to constitute this offence, but that this fear and alarm had to *actually* translate into an action which could threaten public peace. Else, the Judges observed, justice would be converted into a 'rougish

thing' and varying according to 'the indefinite length of magisterial imagination'.[46]

Clearly the District Magistrate and the Judges had different readings of the same law. However, the conflict cannot be passed as mere differences in the interpretation of the section. The seeds of the conflict had a deeper prejudice, in the 'roguish thing'— the ongoing rivalry between the legal profession and the executive officials. The District Magistrates were from Indian Civil Service, a group very important to the consolidation of the imperial rule. J. F. Stephen held it was necessary to uphold the prestige of the District Magistrate who oversaw both revenue collection and the executive administration of a District in criminal matters.[47]Consequently, by section 37 of the Criminal Procedure Code of 1872, the Session Judges could not interfere in the criminal administration of the District Magistrate.[48] Although the Police Act of 1861 had established a separate police department, the District Magistrate as a supervisor of law and order in the districts also implied that the Superintendent of Police had to defer to him.[49] Jogesh Chandra, bred on the fodder of European separation of powers, found the position of District Magistrate distasteful to the flourish of a law bound civic society. He thus wrote in *Calcutta Weekly Notes*:

> …but for the Mofussil Bar the District Judge would have found it impossible to do the duties of an Appellate Court…Matters however, would much improve if the executive and judicial branch of civil service were only separated and steps were taken for the proper training of the latter.[50]

The same District Judge received enhanced powers under an amendment of the Penal Code in 1897 with the insertion of section 153 A and 505 which attempted to define seditious publishing.The section 153 A read seditious publishing as:

> Whoever, by words, either spoken or written, or by signs, or by visible representations, or otherwise promotes or attempts to feeling of enmity or hatred between different classes of Her Majesty's subjects shall be punished with imprisonment which may extend to two years, or with fine, or with both.[51]

Jogesh Chandra attempted to clarify the meaning of this colonial law. Since the insertion did not have any limiting clause, section 153 A of the Penal Code could be used indiscriminately. Section 153 A disallowed any scope to point towards matters which could produce enmity in earnest intention and without malice. Such a limiting clause could have graced the several vernacular editors who came under its jurisdiction. Hence, we find Jogesh Chandra aiding Surendranath Bannerjee, in writing a resolution to amend the Indian Penal Code.[52]

His inability to help the civic society through an adequate translation of law pained him. For this purpose, he visited the prisons where these editors, members of the educated civic society like himself were kept confined. During his tours he was subjected to the racial animosity by the District Judge. An eye witness account of this event was noted:

> The Magistrate suddenly wheeled around, and speaking in a tone used by a half caste warder when giving orders to native prisoners,—he shouted— specially directing his words at J. Chowdhuri, "get out of the prison compound". The tone and manner of the man was offensive in the extreme and Mr. Chowdhuri similarly suggested that he should not speak in that manner to him, as he was doing no harm. This only enraged the Magistrate, and he kept shouting at intervals of twenty seconds: "get out of my prison compound; the public road is your place. Mr. Chowdhury explained to him who he was; and that he had held a seat in the Provincial Council, and so on. But this seemed to make the irate magistrate more angry and he still kept shouting.[53]

This event must have propelled him deeper into despair. Yet he held firm to the belief that the rule of law and freedom of press was the ultimate bulwark to civilized society. In the columns of the *Calcutta Weekly Notes*, he earnestly began to report observations of Chief Jutsice Sheshagiri Aiyer, while judging the case of *New India*, whose world was similar to his:

> But I am unable to hold that the law as to the freedom of writing in India is not an offshoot of the principles that obtained in England, but has been borrowed from Emergency laws of the Third Republic.

> I am prepared to hold that even after the Press Acts, the right to keep a press and to use it is a common law right, and has not the slightest resemblance to exercise of a trade calling for which a licence should be taken out.[54]

Though later the Press Acts were revoked in 1920, Jogesh Chandra's world had almost crumbled and then rebuilt. His inability to help in an adequate translation of the seditious laws, to be a representative of the afflicted sections of the society, as he had done in the time of the Partition, distressed him much. But with the revoke of the law, his beliefs were once again saved, a generation was rescued from disillusionment, and once again faith was restored in the Indian civic society with a strong gravitas towards rule of law. Almost in breathe of relief he concluded the affair in the *Calcutta Weekly Notes*:

> …examined in the light of the new constitutional position, created by the inauguration of the reforms, the retention of the law is of the opinion of many not only unnecessary but incompatible with the increasing association of the representative of the people in the administration of the country…we consider that in the altered circumstances… the advantages likely to be secured by the repeal of this measure outweigh the benefits which could be obtained by its retention in the Statute Book.[55]

The *Calcutta Weekly Notes* thus no longer merely reported the affair, but for a brief period of time, became a reflection of the anxieties that plagued a generation of Indian lawyers cum administrators. It changed its reportage from mere recording precedents to meaningfully decoding the precedents with the newer cases for the Indian legal reading community and beyond.

Conclusion

This paper has attempted to etch out the sensibilities of an editor raised in the belief of British rule of law and a commitment to civic society on the Indian soil. He used his law report to battle through the disillusionments and the dilemmas that this belief often plunged oneself into. For men like Jogesh Chandra, the script was known and modernity could be achieved through representative politics, freedom of the press and the rule of law.[56] Thus every time the British government

deviated from their own prescription, as in Partition of Bengal and later on sedition question, it was an act of betrayal, a denial of those values which they had internalized and used to negotiate and eventually to share the decision making with the government. The character of the *Calcutta Weekly Notes* too changes. No more can it be treated as an 'objective' text of a mere compilation of precedents and happenstances of the High Court. The drifts in the reportage towards the personal sentiments of the editor, began to bear an impact beyond the legal community and subsequently on the genre of law reporting. *Calcutta Weekly Notes* thus became something much more than an ordinary law report- it became at once a sound law report and the podium for the rise of 'public' figure of J. C. Chaudhuri.

Notes

[1] Pramatha Chaudhuri, *Atma Kahini*, Calcutta, the Book Emporium Ltd., 1946, p. 43.

[2] Prasannamayi Debi, *Purba Katha,* quoted in Partha Chatterjee, *Princely Imposter,* Princeton, Princeton University Press, 2002, p.140.

[3] Ibid., p. 140

[4] Pramatha Chaudhuri, *Atma Kahini,* p. 81.

[5] Sanjay Seth, "Rewriting Histories of Nationalism: The Politics of 'Moderate Nationalism' in India, 1870-1905", *The American Historical Review* 104, no. 1 (February 1, 1999) : p. 113.

[6] Obituary, 55 CWN, 10 February 1951, p.52, Indian Law Institute (hereafter ILI).

[7] India'sWhos Who, 1937-38, p. 152.

[8] 1 CWN December 20 1896, p.2. ILI.

[9] Pramatha Chaudhuri, *Atma Kahini,* p. 88.

[10] Home, Public, February 1906, No.155-167, National Archives of India (hereafter NAI)

[11] Sumit Sarkar, *Modern India : 1885-1947,* Delhi, Macmillian, 2005, p.106.

[12] Home, Public, February 1906, No.155-167, Memorial from the Bengal landholder's Association to the Officiating Chief Secretary to the Government of Bengal, 1 March 1904. NAI.

[13] Ibid.

[14] Ibid. Letter from W.C.Macpherson, Officiating Secretary to the Government of Bengal to the Secretary to the Government of Bengal, 6 April, 1904. NAI.

[15] Ibid.

[16] Sumit Sarkar, *Modern India : 1885-1947,* p. 109.

[17] Ibid.

[18] 8 CWN, 19 January, 1904, p. 17. ILI.

[19] 8 CWN, 29 January, 1904, p. 77. ILI.
[20] Twenty Sixth Annual Report of Indian Association, 1904, p. 27, Nehru Memorial Museum and Library (hereafter NMML).
[21] Ibid, letter from Bengal Chamber of Commerce to the Secretary of the State, 3 February 1904, NMML.
[22] Ibid.
[23] Home, Public, September 1905, no. 302.
[24] *Hindoo Patriot,* 31 July 1876.
[25] Twenty Eighth Annual Reports of Indian Association,p.1, NMML.
[26] Third Annual Report of Indian Association, p.1, NMML.
[27] Twelfth Annual Report of Indian Association., it had in 1888 1 branch in Burdwan, 1 in Bankura, 1 in Rajshahi, 2 in Birbhum,1 in Backergunge, 3 in Mymensingh, four in Howrah, 4 in Murshidabad, 4 in Jessore, 7 in Hoogly, 8 in Nadia, 8 in Faridabad 29 in Midnapore and 33 in Pabna. Outside the Presidency it had branches in Lahore, Ferozepur, Allahabad, and 3 in Assam. NMML.
[28] India's Who's Who, 1937, p.152.
[29] SurendranathBannerjea, *Nation in the Making : Being Reminiscence of Fifty Years of Public Life,* Calcutta, O.U.P., 1925, p.135.
[30] Ibid, p. 135-8.
[31] Inaugural Speech by J.C.Chaudhuri, *'The Calcutta Congress and Conference : A Collection of the Presidential, Inaugural and other Important Speeches,* Madras, G. A. Nateson & Co., 1906, p. 140.
[32] Sudipta Kaviraj, 'On the Structure of Nationalist Discourse', *Imaginary Institution of India: Politics and Ideas,* New Delhi, Permanent Black, 2010, p.122.
[33] Home, Public, February 1906, No.155-167, Letter from W. C. Macpherson, Officiating Secretary to the Government of Bengal to the Secretary to the Government of Bengal, dated 6 April, 1904. NAI.
[34] 7C.W.N., 20 November, 1902, p.10. ILI.
[35] 7C.W.N, 7August, 1902, p. 265. ILI.
[36] Home,Public, February 1906, No.155-167,Letter from Indian Jute Mills Association, dated 29 January 1904, Calcutta Baled Jute Association, 27 January 1904. NAI.
[37] Ibid., Letter from Indian Mining Association dated 23 February 1904. NAI
[38] Ibid, Letter from P. J. Monahan, Chief Secretary to Assam to the Secretary to the Government of Bengal, dated 6 April 1904. NAI
[39] 9 C.W.N, 20 November, 1904, p 10. ILI.
[40] Ibid.
[41] 8 CWN, 21 December,1903, p. 42. ILI.
[42] J. R. MacDonald, *The Government of India*., Oxford, Trading and Headley Brothers Ltd. 1985 1st edition, 1987, 3rd edition, p.227.
[43] 18 CWN., 26 November, 1913, p.1. ILI.
[44] 21 CWN, 20 November, 1916, p.11.
[45] 11 CWN, 2 March 1907, p.110.

[46] 2CWN 21November,1898,p.1, In the matter of Manbirvs the Empress of India
[47] RadhikaSingha, 'Punished by Surveillance: Policing 'Dangerousness' in Colonial India 1872-1918', *Modern Asian Studies,* Cambridge University Press, p.10.
[48] Ibid., p.11.
[49] Ibid.
[50] 8C.W.N., 26 February 1904, p.97, ILI.
[51] Ibid, p. 71.
[52] Home, Political, April 1914,No.65. NAI.
[53] J. Keir Hardie, *India : Impressions and Suggestions,* London : Independent Labour Party, 1909, p. 19-20.
[54] Ibid, p. 23.
[55] Ibid.
[56] Sanjay Seth,*Rewriting Histories of Nationalism: The Politics of 'Moderate Nationalism in India, 1870-1905*, p.112.

CHANGE AND CONTINUITY IN THE ECONOMIC LIFE OF PAUDI BHUYANS IN THE ERA OF GLOBALIZATION

ABHISHEK BHOWMIK
SUTAPA MUKHOPADHYAY

Introduction

The society we belong is constantly changing its values, its beliefs, its technology and even its knowledge and understanding. The change is primarily classified into two broad categories, individual driven changes that are alteration caused by the individual's need and wishes and the other is community driven, which supports the community's need and wishes. The individual driven changes are limited to individual preferences and are hard to trace in the time perspect. On the other hand, the changes that are community driven are slow, have a wider reach within the community and are easily traceable in the time perspective. The present paper primarily focuses on the community driven changes that are traceable among the Paudi Bhuyans and the continuity of the traditional practices which are preserved with respect to Economic activities of Paudi Bhuyans.

Economics is the study of choice under scarcity. The provision of basic needs, food, shelter, clothing and implements involve choice which is not only guided by the availability of the alternative items but by the prevailing patterns of culture. (Herskovits, 1952). From the inception of the concept of economy, it comprises three major parts which are production, distribution and consumption. These three parts are found in most of the modern economies of the world as well as among the Paudi Bhuyans, a Schedule Tribe living in eastern of India, though the economy of the group is very simple.

Study of the economy of the simple societies attracted the attention of western anthropologists right from the beginning of the last

century, the study mainly focused on a view of anthropological concept of 'holism' and the process was accelerated from 1940's onwards. The Economic subsystem of any traditional society constitutes the means by which goods are produced, exchanged, redistributed and consumed. Thus, in a nutshell, we can put forward the view that in non-literate and non- industrial societies economic and socio cultural factors are mutually interdependent and supplement each other.

Grass (1927) had coined the term 'economic anthropology' and synthesized anthropology with economics. Herskovits (1952) and Firth (1965) published books on 'economic anthropology' conceptualizing the fact that anthropologist could benefit by studying analytically and applying related aspects of conventional economics to primitive and peasant economies.

Materials and Method

For the present paper, Paudi Bhuyan community has been considered for study of their traditional agricultural practices and gather insight into indigenous knowledge system associated with it. Paudi Bhuyan, one of the earliest inhabitants of eastern India, are mainly concentrated in Bansapal Block of Keonjhar district of Odisha. They also live in the adjoining areas of Bonai and Pallahara sub-divisions of Sundargarh and Dhenkanal districts of Odisha. The present study is conducted in six villages under Kuanr Panchayet in Keonjhar district of Odisha. As they are inhabited in an around forest area their economy and livelihood pattern are related to the forest environment and are maintaining a symbiotic relationship.

The methodology adopted for the present study include house hold schedules, case study, interview, focused group interviews and observation of different aspects of agriculture. Data were also collected from members of traditional councils and Gram Sabha, office bearers of Kuanr Panchayat and BDO office of Banspal block. Exact geographical location of the village is noted. The location is also noted in relation to the nearest town, block office, post office

and police station. Communication facilities in terms of roads and railway are noted. With a view to understand sources of raw material, the location of forest and water sources is marked. In addition to communication modern amenities like education institutions, hospital, safe drinking water, shops etc. are also pointed out. Finally, market both wholesale and retail is studied.

The Paudi Bhuyans

The Bhuyans are one of the tribes of Odisha (Particularly Vulnerable Tribal Group) found mainly in the Keonjhar district of Odisha. They are also found in large numbers in the adjoining states of Jharkand, Bihar, West Bengal, Assam, Uttar Pradesh, Chhattisgarh, Madhya Pradesh and Tamilnadu. They are divided into two broad sections - Southern section with its centre in Odisha, comprising backward section of the tribe and Northern section with its centre at Chhotonagpur plateau, the relatively advanced section of the tribe (Roy 1935).

According to the Nayak (2010), the Paudi Bhuyan is one of the major section of Bhuyan tribe which has been identified earlier as a primitive tribal group of the State of Odisha. This was on the consideration of their habitat, technology, methods of getting food, low literacy rate etc. They are mostly found in Keonjhar, mountaneous areas of Bonai, hill tracks of Sundergard and Angul districts. The name 'Bhuiya'might have derived from the Sanskrit word 'Bhurni' meaning land or earth. The tribe is also called variously as Bhuiya, Bhuiyan and Bhuinya. (Roy, 1935).

Economic Life of Paudi Bhuyans

The economic life of the Paudi Bhuyans mainly centres on shifting cultivation which is the primary source of their livelihood. The produce is not sufficient to sustain them through the whole year. Therefore, the Paudi Bhuyans engage themselves in different works, such as, collection of minor forest products, hunting, fishing, basket making, wage earning and other economic pursuits to supplement their income from land.

The following paragraphs highlight an account of the land system of the Paudi Bhuyans, their agricultural practices, food gathering pursuits and another source of living along with the division of labor between the sexes, live stock maintenance, trade, marketing facilities, wealth and inheritance and other aspects of Economic life.

Land

The Paudi Bhuyans live between the blocks of hills and forests intersected by rivers and ravines and by a forest covered plateau. The vast area that the Paudi Bhuyans are living, are not under any kind of strict surveillance from the government so the Bhuyans are free to cut and clear the patches of forest to practice their slash and burn cultivation. The land is communally owned by the villagers. Each Paudi Bhuyan village has a definite demarcated area which has been allotted to them by the feudatory chiefs and the village only has access to practice swidden cultivation and hunting, fishing, gathering, within the pre-allocated area. Generally, the Bhuyans prefer not to trespass the boundary of other villages.

If any dispute arises between the two villages, then on an appointed day village council and its members assemble at a pre-decided place and the conflict over the dispute is settled. The appointed place may be either in any of the village's *darbar* area or the disputed place itself. Each village contributes a healthy chicken, an earthen pot, and some un-husked paddy. Both the chickens are then put inside the earthen pot with some un-husked paddy and is sealed from outside with mud and is kept overnight. The next day both the hens are checked. If any chicken died, then the corresponding village loses the right to the disputed land and if both the chickens are alive then the disputed land is equally shared.

Types of Land

Biringa : A patch of land brought under cultivation for the first time is called *Biringa.* All the forest land is owned by the village and every year patches of forests are distributed among the individual families for cultivation. During the period of cultivation, a piece of

land remains under the individual ownership, but after it is left fallow, it reverts back to the *village. Biri* (black gram) is the principal crop grown in *Biringa,* but a variety of other crops such as niger, suturi, kolatha (horse gram) mung, pumpkin, goard, etc are also grown in it.

Kaman : A patch of land that has already been cultivated as *Biringa* and is further cultivated for the second year is called *Kaman.* A kind of fast growing paddy is planted principally with gangai, ragi, maize, ruma. These are sown on all sites of a *Kaman* to mark the boundary lines.

Guda : If a patch of *Kaman* is cultivated for the third year it is then called *Guda.* After being cultivated for consecutive two years, a patch of *Guda* generally lacks much of fertility. Hence such crops like paddy, Niger are usually sown on such plots after three successive years of cultivation. The land is left fallow 5-6 years till the fertility of the soil is regained by natural vegetation.

Bila : These are permanent paddy plots present close to the river or perennial stream body in the valley, so that the water of the river can be diverted to irrigate these lands. Such lands are individually owned on a permanent basis. Paddy is the only crop grown in these lands.

Bakadi : These are the lands close to residential dwellings, preferably at the back side of the home stead, but can be present on other sides as well. In some houses, the three sides are found to be used for cultivation. These lands are owned permanently by individual families. Due to regular dumping of cow dung waste after washing the floor the lands become furtile. These lands are generally used to cultivate mustard or maize in alternate year.

Ownership of Land

Ownership of the land varies among the Paudi Bhuyans. Land is not owned permanently by individuals, some are owned communally by the village and some of the land is owned by the individual family which exercises ownership during the period of cultivation.

Distribution of Land

Every Bhuyans is a land holder, big or small. Table 1 shows the trend of distribution of land among the Bhuyans of Kuanr village.

Land	Percentage of Holder
Small (less than 3 cottah)	69.00
Medium (3 cottoh to 5 cottoh)	21.00
Large (5 cottoh and above)	10.00

From the above-mentioned table, it is very clear that the cultivable land among the Paudi Bhuyans is very less. The small land holding which is less than 3 cottah {67m^2 X 3 = 201m^2 approximately} is more in percent (69%). The 5 cottah or 335m^2 landholdings on an average is quite low (21 %). Large landholding is lowest (10%).

Other than those mentioned above, some of them, particularly those living in the plains, have taken to petty trade and commerce and industrial employment. Rope making and ordinary carpentry are known to all men and mat making is the recreational activity of the Paudi Bhuyan women. The Bhuyans follow division of labour by sex for certain activities. Generally heavier works such as cutting trees, ploughing, sowing, hunting and fishing are carried out by men while lighter works such as cooking and other domestic works are mostly carried out by women. Thatching of houses and climbing trees are taboo for the women folk. Works like forest clearing, weeding, transplanting, harvesting, threshing and collection of minor forest products are carried out by both men and women.

The land in the valley bottom *(Bila)* are put to permanent cultivation where paddy is the only crop grown. As water is available in the valley throughout the year these lands are the best for paddy cultivation. Such a favourable condition has induced them to apply chemical fertilizer in their wet lands for better production. In addition to these lands they have flat lands at elevated place *(nala)* which are used for growing niger, pulses and minor millets. The kitchen garden *(Bakadi)* is meant for growing vegetables, tobacco, maize and mustard.

The *Bila, Nala* and *bakadi* lands are privately owned while the lands under shifting cultivation are communally held. Both broadcasting and transplanting are practiced in growing paddy in wet land while only broadcasting of seeds is practiced in growing crops in *nala* and *bakadi* lands. Except for *bakadi* land and wet land in no other types of land manure is used. The use of bullock driven ploughs for tilling all types of land is common in the village.

Cultivation is a family affair in which all able bodied adult members of the family cooperate. Whenever any extra labour is required it is commissioned not by hire but by exchange basis. Outside labour is required only for weeding and harvesting. A man having no draught animals may take the help of others having such animals. The Bhuyans domesticate various animals like cow, bullock, goat, sheep and fowl, etc. The main purpose for keeping cattle is not for milk but for draft animal for cultivation and for breeding.

The Paudi Bhuyans practice shifting cultivation (Dash, 2006). This goes by the term *Poduehasa.* They generally cultivate a patch of forest land for three consecutive years after which it is left fallow. The patch under first year of cultivation is known as *Biringa,* the second year as *Kaman* and the third year as *Guda.* These patches are located on flat hill tops stretching up to foot hills. The hills in this area are generally flat topped and without much stone boulders and the gradients are gentle. After cultivating a patch of land for three years they leave it fallow for a period of 5 to 6 years for rejuvenation. Previously the fallow period was 10 to 12 years. But the main cause for its reduction is the population pressure and shortage of land for *podu* cultivation. The land under shifting cultivation belongs to the village and a patch is distributed by the village committee to the individual and it remains in possession for cultivation to the man as long he cultivates it.

The first year shifting cultivation *(biringa)* involves several stages given below. It begins with selection of hill slopes in December-January by the village committee headed by Pradhan, tree felling and bush clearing from February to April, filing of felled trees and firing

(anapuda) in April-May, bush clearing *(patikaa)* in May, sowing *(Buna*) in July after *Akhin Parab,* ploughing and hoeing *(bhuinyanga)* in July immediately after hoeing, weeding and debushing *(Judabaehha)* in - September-October after *Ashiaripuja,* watching the crops in November-December onwards. The crops grown during the first year are *Kolatha (Macrotyloma uniflorum), Biri (Vigna mungo), Rasi (Guizotia abyssiniea),* and various types of vegetables and creeper plants.

During the second year of shifting cultivation the main crop grown is a short duration paddy *(aman)* along with Gangei *(Sorghum bicolor).* The former is sown in the middle of the plot and the latter on the borders of the plot. Besides, they grow Mandia *(Eleusine coracana),* Kangu *(Setaria italica),* Sarso *(Sinapi sarvensis*) and various types of vegetables in the second year.

In the third year of shifting cultivation *(Guda)* only *Rasi* is grown. If a patch fetches good harvest in the second year then it is cultivated for the third year. The same patch can be brought under fourth year cultivation if there is a good harvest in the third year. The Paudi Bhuyan use very simple implements in their agricultural operation. The most important implements used in shifting cultivation include plough, leveler yoke, crowbar, spade, sickle, knife, wooden pole, etc.

Preparation of Land

The land that has been selected for agriculture consists of big trees, small trees, shrubs, grasses etc. The big trees that are being cut are sold to timber markets. And all other residues of the plants are put together in stack and set into fire. The fire clears the land for cultivation. Paudi Bhuyans manage to put proper control on the firing, to check any unnecessary damage to the vegetation of the nearby area.

Ploughing

Ploughing is done as per the requirement of crops to be sown and the season of production. For instance, ploughing of land is mostly practiced in the middle of June-July. The method of ploughing of fields is similar in almost all the villages under study. Locally made plough *(hal)* and leveller *(kuruala)* are used for ploughing. Implement

like cylindrical iron rod *(sabal)* is also used for the removing stones. Ploughing is done 2-3 times before the rainy season and in the rainy season also. This practice of ploughing is also interwoven by traditions and customs. Ploughing is necessary for preparation of the land to conserve the soil moisture, to uproot the weeds, to make the soil arable and also for the mixing of ashes that are produced from the burning of trees and shrubs.

The method of ploughing varies according to the type of soil and terrain for example the animal driven ploughing is done where there is flat land and hand-held ploughing is done on the slope. On the slopes where cultivation is practised farmers plough the field mostly in the lines perpendicular to the direction of the slopes. It is amazing to find that the farmers have a better knowledge of how the soil erosion in the inclined field can be checked.

Precaution before sowing of seeds

A number of precautions are taken before the sowing. These are related to ploughing of land, proper moisture, proper depth of channel and the quality of seed for high rate of germination. The farmers of the villages take precaution before sowing by removal of weeds and unwanted materials that may hamper the proper germination of the seedlings.

Selection of seeds and preservation

The seed selection is a complex process and is varied according to the villages. They practice various measures to select seeds like quality of shine, wheather it is in good shape, without breakage, and in many cases the farmers do admit that they collect and store them out of the best plants from the previous yield. They carefully select the patch of crop area that is suitable for seed preservation for next sowing. They harvest it separately, process it and store it carefully.

The Paudi Bhuyan developed their own technology for selection of seeds. For example, in the selection of paddy seeds for the next sowing, farmers first identify a few rows where the quality of crop is best. Such plants are then carefully harvested and panicles with bold, heavy, undamaged and fully ripe grains are kept for the seed.

Preservation of seeds is also done in indigenous methods. The seeds are dried in sun for several days to make it hard and moisture free. Most of the farmers put their seeds in their own houses for their personal use. More than 80% of the respondents informed that they kept their seeds in the locally made airtight buskets. This is a drum like container made of thin bamboo strips. Both the inner and outer walls of container are plastered with mud and cow dung, and seed is mixed with dry neem *(Azadirachtaindica)* leaf and ash. They keep it protected from moisture.

Another set of preservations of seeds includes the set of dry paddy straws are interwoven into a rope with a thickness of 10cm to 12 cm. These are called *Benti.* The *Benti* is then rolled over making a basket like shape in which the seeds are kept along with the dried *Begunia* leaves *(Vitex nigunda L.)*

The seeds are occasionally exposed to sunlight. This practice is useful in maintaining the quality of seed and grains.

Irrigation

Paudi Bhuyan practised certain systems to preserve water resources and the distribution of these water resources. In a hilly terrain, water flowing in small streams was traditionally tapped for irrigation through construction of nallah. These nallahs are simple diversion channels that convey stream flow, partly or wholly, to fields whose elevation is lower than that of the point at which the stream is diverted. They use bamboo and banana plants to make these temporary nallahs. In hilly terrains farmers plant small trees at the end of the land, which checks the sudden flow of water. Due to the presence of trees the flowing water slowly enters the ground. It helps in increasing the ground water table, which indirectly helps in sustaining the crops from water scarcity. Flow irrigation was not possible in an undulating topography; hence the run off water is stopped at different levels and allowed to soak deep into the soil. This resulted in availability of adequate moisture at root levels which helped for better crop production. Paudi Bhuyan used to go for

mixed crops in hilly terrains. Mixed cropping with varieties having different maturation periods was an adaptive strategy to cope with uncertain returns of dry cultivation.

Making terrace

Though Paudi Bhuyans depend on mercy of monsoon for their survival they have a tradition of water management. The agricultural land is divided into small plots with stone nodules plastered with mud. By means of channels they regulated the flow of water from the natural hill streams and irrigate their terraced fields. They are terracing the hill sides for rice cultivation. The bed of streams was levelled and terraced in some places. Flood water was drained out by some drains on both the sides. By doing this they take advantage of perennial springs to irrigate their narrow-terraced fields during late winter and early summer months. In order to pass the water from one field to another they make a hole in the wall of the land. The hole is to be made just above four inches from the level of the land so that the entire water cannot run off to lower terrace.

Weeding

In the months of September-October, the first weeding of the cultivated plot of land is done. Weeding is meticulously done by uprooting the weeds among the grown crops. It is to be done in such a way that it does not harm the grown crops. The weeding is mostly done by the women and is done by simply uprooting the weeds by hand. The weeds are collected on the earth embankments of the fields. There may be more than one weeding cycle till the harvest.

Harvesting

Harvesting is done according to both the year of cultivation and the crop that is cultivated. Paudi Bhuyan generally cultivate *rasi* (sesame) in the first year and it is being cultivated in the month of November- December.

In the second year, the harvesting was done from Novemeber to Jannuary and in the third year it again is restricted to November December.

Threshing

It is the process of loosening the edible part of cereal grain (or other crop) from the scaly, inedible chaff that surrounds it. It is the step in grain preparation after harvesting and before winnowing, which separates the loosened chaff from the grain. Threshing may be done by beating the grain using a flail on a threshing floor.

Winnowing

Wind winnowing is an agricultural method developed by ancient cultures for separating grain from chaff. It also removes weevils or other pests from stored grain.

The Paudi Bhuyan practice it extensively in the paddy cultivation procedure and other crops as and when required.

Husking

In village Kuanr for every five household there is a husking lever. The husking lever can be utilized by more than one household on mutual understanding.

Continuity of cultural traits in the sector of cultivation

It is important to note that there is continuity of the trait in practicing this kind of cultivation. Although the people has adopted bullock driven plough as their main instrument to carry out agriculture but traditional features of agriculture like self-replenishment of agricultural plot by abandoning the plot for certain period of time can be traced from the prehistoric time period. The fertilizers are also not included as a cultural practice though the concept of fertilizer and its effect on the crops are well known to the villagers. Though they mostly depend on rain but channeling of natural streams is not to be ruled out completely as some instances are well documented.

Rice is their staple food and considered superior to all other types. Whatever amount of paddy is procured is never sold. Besides, they exchange *birhi* and *rasi, sarso,* etc for rice. Besides rice they take preparations of millets and other cereals. They eat pulses occasionally,

particularly on festive occasions. Roots, tubers, flowers, and fruits which are collected from forest to supplement their food to a great extent during lean months.

Among the alcoholic beverages the Bhuyans take rice beer called *Handia* is extremely popular. *Mahua* liquor, toddy extracted from date palms, *salap* drinks extracted from sago-palms and liquor prepared out of cereals are common. The Bhuyans are habituated to both chewing and smoking. Men smoke tobacco grown in kitchen garden, by rolling it in *sal* leaf and women chew it with lime. Besides, bidi, tobacco paste *(gurakhu)* and betel are being used by them purchased from local market.

Pastoral Activities

Pastoralism is not an important economic occupation as very few families are engaged in it as a whole time occupation. As the variety of cattle that are being reared are not miltch variety. They are only used for the agricultural purpose. Beef is a taboo for the Bhuyans. The other most common animal is goat. Both she and he goats are reared and are primarily used to sell them in the weekly market in exchange for money or are consumed if not sold. The goat is also offered as a sacrifice to the gods and goddesses. Cattle and goats are grazed in their respective places as designated by the village council members.

Pastoralism is also considered as traditional occupation and generally preceded by hunting (Fagan, 1972). Paudi Bhuyans living near the forest has the advantage to feed their cattle naturally and they rarely purchase grass for the cattle. They neither slaughter them for food nor they sell milk. Thus it also shows the primitive form of cattle rearing which is practiced in contradiction to the general practice of cattle rearing present anywhere else.

Poultry Farming

Most of the Bhuyans family maintains a considerable number of poultry, mostly Hen. They are mostly used as food or sold in the market. Eggs obtained from fowls are either consumed or sold. Fowls

are used on festive occasions and cherished as great food. Moreover eggs and fowls are very important as religious offerings. Almost all their gods and goddesses and ancestors require them as offerings. They are also used in almost all ceremonies of life cycle. So it is more economical to breed the fowl than to purchase it from the market.

Fishing

Fishing is limited to very few Bhuyans and are self-sustainable type. They consumed it themselves and they catch in very limited in the quantity. They catch fish in the natural springs and nearby river with indigenously built trap only.

Fishing is considered as traditional occupation as is practiced since pre historic times. (Fagan, 1972). In the current century, even the non-fishing community generally captures fish using nets made out of nylon or any other artificial fiber. But Paudi Bhuyans mostly use the trap made out of bamboo and keep it in running water to catch smaller fish. Thus here also they are guided by the 'patterns of culture' which guides them to practice this kind of simplistic fishing.

Fruit Collection and Honey gathering

One of the minor economic occupations of the Paudi Bhuyans are fruit collection. They usually gather the fruit from the nearby jungle. Mostly women are engaged in the collection of fruits but men and children are also involved in this minor economic activity of collecting fruits. Mango and jack fruit are the most common fruits that are being collected from wild plants. They even collect flowers of mahua plants that are being used to prepare country liquor. The Bhuyans are in the habit of collecting minor forest produce extensively for their own consumption and also for sale as a secondary source of income. The important items of forest collection include Mohua flower *(Madhuca indica)* seed, Mohua seed *(Madhuca Indica)*, mango *(Manifera Indica)*, Jack fruit *(Artocarpus heterophyllus)*, Tamarind *(Tamarindus indica)*, Haridra *(Terminalia chebula)*, Bahada *(Terminalia bellerica)*, Anala, Nux vomica Kochila seeds, *Phul Jhadu (Thysanoleana*

maxima), Jhadu (Aristidasetacea), Gaba (Jetropha curcas), various types of green leaves, mushrooms, edible roots and rubbers. They also collect fire wood, thatching grass, fibres for rope making and different types of herbs and shrubs of medicinal value.

Wage earning

Some of the Bhuyans are now a day engaged in 100 days work that is being provided to them by Panchayat under the National Rural Employment Guarantee Act. Wage earning is only occasional and even prevalent in the areas where the Bhuiyas live in contact with the other peoples. Most of the wage earning that has been observed is engagement of development work that are sponsored by the government. Agricultural labourers are absent and if engaged as agricultural labour, it is only on the basis of exchange of similar labour as and when necessary.

Specially Bhuiya women, young girls and occasionally men are engaged in collecting many forest products that are industrially needed. These are being collected for some contractors. They are paid according to the collection and the item. Payment ranges from Rs 30 to 100. They mostly collect Resins, barks of certain plants, Gwn etc., that have no direct resale value in the local market.

Market and Price Mechanism

The market is extremely vital to study from the material exchange point of view. The market not only provides the essential items required by the villagers, but also opens the avenue to access the goods which are new and can really help them in the betterment of their daily life style. Thus market study is done to analyse the items that are present in the market, procurement of the goods those are present for exchange. The primary focus of the study is to access the villager's response towards the particular items and the mode of payment that is prevalent in the market i.e Price Mechanism.

There are a total of 56 stalls that are classified in two broad divisions. The divisions can be done on the basis of the construction of semi-permanent structure and without structure. The semi-

permanent structures are built upon the fixed base that is made up of concrete and the platform is raised above the surface to support the upper structure. Generally, the upper structure is constructed mostly by bamboo and occasionally iron pipes are also utilized to erect the structure. All the shops used plastic sheets as roofing and covering the structure.

Mostly the semi-permanent structures are being raised by merchants whose articles are costlier and more prone to damage by sunlight and rain, such as, clothing articles, grocery items or ornaments they are generally placed within the raised semi-permanent structure. But items like vegetables, fish and smaller commodity, shops are seldom seen with structure.

Shops	Percentage
Clothes	32.2% (18)
Grocery	7.2 (4)
Oranaments	10.7 (6)
Food Items (Vegitables, Fishes, Snacks)	21.4 (12)
Utensils and Kitchen aplliances	14.3 (8)
Hardware	8.9 (5)
Electronics	5.3(3)
Total	100% (56)

Price Mechanism

The economy of Bhuyans is definitely influenced the general Odishan economy and thus have the same exchange mechanism is followed except in some of the cases where the barter is more preferred over the monetary exchange system. Bhuyans price mechanism can be termed as mixed pricing system that has been guided by the general rule of feasibility. The Bhuyans shift from one pricing system that is from monetary exchange (where the goods are exchanged with money) to barter system (where the goods are exchanged with goods). The guiding principal of exchange is solely

in the hands of Paudi Bhuyans' need. If they are in need of Rice which is their staple food and is being consumed in more or less 80-20 percentage. That means if we measure the amount of food consumed by Paudi Bhuyans of any day it will contain 80% of rice (bhata) or rice products and the remaing 20% may be products like pulses, vegetables etc. So, when the need is single product which is rice and is the primary need of the mass of the Paudi Bhuyans the barter exchange is commonly utilized.

Conclusion

Purpose of the present paper is to understand the role of culture behind the broader economy of Paudi Bhuyans. The paper seeks the patterns of culture which is guiding the behavior of Paudi Bhuyans to sustain the primitive form of economic system in this globalized world. The practice of shifting cultivation in the forest hills near to their habitation is more culturally constructed rather than pursuits of the economic needs. Paudi Bhuyans live in the village which can be self-sustaining only if they are allowed to utilize the forest and its resources. The self-sustenance is readily hampered when they try to imitate the economic pursuits adopted by the members of other villages surrounding them. So in the digital era where the globalization has penetrated in every nooks and corners — Paudi Bhuyans are more comfortable in following their age old practices in their economy.

Thus cultural pattern followed by the Paudi Bhuyans in their existential primitive economy becomes general rule, unless and until there is drastic or forced change by any external agency. This may induce change in their total life ways that include relocation, forced development by government. The process of continuing with the primitive economic model possibly be changed if they are offered good alternatives. It appears from the above mentioned facts that the Paudi Bhuyans are more comfortable in pursuing their age old practices with very negligible changes in their economic pursuits. They find their own cultivated rice tastier than the rice which is supplied through PDS supply from Government of India. They prefer

to continue with their traditional cultural process which they link with their heritage and cherish them as age old practices which are blessed by their ancestral forefathers.

All of the economic pursuits that are followed by the Paudi Bhuyans which are discussed are closer to nature and its by products, which are more experience based in their cognition. Cultural perspective of economic pursuits is closer to the interaction between man and environment. This appears to be a continuity of culture into present from the pre historic periods. It can be said in conclusion that the practices that are followed by the Paudi Bhuyans are more culturally driven than the driving forces of modern economy, namely; globalization, modernization and westernization. It is the nature and man which co-habits from the prehistoric days to the present time. It allows a subsistence pattern for the Paudi Bhuyans, which is age old, practiced by the people of their earlier generations and is still continuing.

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The following papers were read—

1. *On the Barisál Guns.*—*By* Babu Gaurdás Bysack (postponed from last meeting.)

I need scarcely make an apology for reverting to the subject of the physical phenomenon known as the Barisál Guns, a subject too important and too interesting to be lost sight of, or buried in oblivion. My object in doing so, is to place on record certain facts that have come to my notice since the subject was, for the first time I believe, broached at your meeting in 1867, (*vide* my paper on the Antiquities of Bagirhát published in Part I of the Journal for 1867, Vol. XXXVI), and to ask you not only to invite the attention of all learned scientific gentlemen, but to organise a system of enquiry and observation with a view to arrive at a solution of the problem.

You are already aware that the sounds resemble the booming of distant cannonade, and that they are usually heard during the months from April to September in a lull after a squall, or after a shower of rain, or when the clouds begin to break up. Barisál Guns they are called because at Barisál the explosions happened to be first noticed, but the area is vast over which such noises are heard. They are heard as high up as at Fureedpur and all over the south of Backergunj and Jessore (now Khulna) specially in the neighbourhood of the Baleswar river.

Recent facts that have come to my knowledge shew that other places than those enumerated above are wont to enjoy the honor of these mysterious salutes.

Similar sounds are heard, I heard them distinctly, at Tamlook. While in temporary charge of the Sub-Division during April and May 1883, and staying in the Government Bungalow standing formerly some way off, but at the time of my residence only 25 feet from the edge of the high bank that was being cut away by the river Rupnarayan, it was on an afternoon between 1 and 2 o'clock that, after a shower of rain, the reports like those of a distant cannon struck my ears. The similarity of the sounds to what I knew as Barisal Guns at once attracted my notice and excited my curiosity. I made an enquiry of the oldest inhabitants, and they told me that they were accustomed to hear the sounds from their childhood, but they knew not how to account for them, at least no superstitious legend like the Khanja Ally salutes ascribed to the Barisal Guns was attached to them. I utilised the opportunity by sending out a dinghy to cruise up and down the river for several miles, in order to ascertain if the banks had any where fallen in heavy masses, but nothing of the kind was discovered to favour the theory of those who ascribe the noise to such a cause. When I mentioned the fact to Mr. Medlicott he told me that he has heard from a friend that similar sounds are heard at Cherra Punji. Babu Karunadas Bose of the Subordinate Judicial Service, an inhabitant of Dacca, wrote to me to say that these strange reports are heard in Vikrampur, more frequently in the wet than in the dry weather, but never in Dacca. These places are far out of the reach of the sea-beach, a fact that directly discountenances the surf theory, *i. e.*, surf breaking on the sea-shore and causing the noise, which seems to have found favour with certain learned gentlemen, who confidently laid stress upon it when the subject came in for fresh discussion at your meeting in August 1870: the theory, however, still remains where it was in the dark region of conjecture.

In order to arrive at a correct solution of the problem one must enquire on the spot, and frame his inquiries according to such information as he can collect, and such suggestions as he may gather from his first impressions. Any one who hears the noise may trace out its cause and origin. Very little can be suggested by one who has not heard it, and who is many hundred miles away. Mr. Blanford told me that with that view a set of questions from the Society were prepared, printed and circulated, but that no information was received in reply to them. Diligent search was made for a copy of the questions but without success.

I would suggest that a fresh effort be made to collect information, or to direct inquiry from a scientific point of view, so that the origin or cause of the sounds may be ascertained with as much precision or

accuracy, as the resources of science may enable us to do. If necessary, Government might be requested to aid the endeavours of the Society by asking the local officers of the places in which the sound is audible to institute inquiries in reference to the points suggested in the paper of questions that may be sent out to them.

The theories that have been hazarded to account for the cause of the phenomenon are the following :

1st. Breaking up of surf.

2nd. Falling of heavy masses of earth in the river.

3rd. Electrical discharges under water, or explosive gases stirred up by some sort of volcanic action escaping through the waters.

4th. Some subterranean or volcanic agency.

Postscript.

Since the above was written copies of the former series of queries referred to by me have turned up. I wrote with a copy of them to my friend Mr. P. N. Mittra, Barrister-at-Law, who resided at Barisal for several years, and whose professional duties took him to all parts not only of Backerganj, but also the neighbouring districts, asking him to let me have his impressions of the phenomenon. The answers given by him are noted below :

1. "The sounds are like the reports of big guns going at a distance. They are always heard at regular intervals, sometimes following one another in quick succession like minute guns, sometimes at intervals of 10 or 15 minutes. So far as I have been able to observe, I have heard these guns going sometimes for 3 or 4 hours together.

2. These reports are generally heard in the mornings and evenings, and seldom or never in the middle of the day. They may be heard at all times of the night.

3. The rainy season is the time of the year when these reports are most frequently heard. They are generally heard *after* a heavy shower, and sometimes *before*, just when the clouds have formed in the sky.

4. The reports seem generally to come from the south and are always accompanied by a *south wind.* I observed these phenomena in the town of Barisal itself and also in the southern parts of the District of Backerganj.

5. I know from personal experience that they are heard most frequently during the rains. I have never heard them in the cold weather or at the beginning of the hot weather either, during my eight years' experience in the district of Backerganj.

6. I never heard these sounds at Rungpore, and I am not aware that they are heard there. I have heard that these sounds can be

heard at Rajpur near the Sonarpur Railway Station (E. B. S. Railway) a few miles south of Calcutta."

It is necessary, with a view to see that all the facts already ascertained are correctly placed in their true light, and beyond the possibility of a doubt or dispute, that I should refer to one or two points in Mr. Mittra's answers, and also in the lucid summary of our President.

Mr. Mittra observed that he never heard these sounds during the cold weather. This qualifies the remark I made in my first paper on the Antiquities of Bagerhat, that at that station the sounds are heard at all times of the year. I did not carefully specify the periods when these sounds are most frequent, but generally stated that they occur most distinctly during a lull after a storm, or after a heavy shower of rain. It was not noticed by me that they were heard before a shower. It is certain that they do not occur after every shower of rain. I know from personal experience that at Barisal these sounds are very common, as common as they are at Bagirhát, but the fact recorded by me that, though the sounds are heard at Bagirhát they are not heard at places near there, nor in other parts of the Sunderbunds equally distant from the shores of the Bay, and where the surf is violent, might, I suspect, be open to correction. It may be accounted for in this way, that during the cold weather, November to February, I used to be absent from the Station and moving about (on tour) in the interior of the Subdivision, and the reason why I did not hear the sounds at the places I encamped, is because they did not occur at all. Having been familiar with the noise during nine months of the year at Bagirhát, it was but natural that the impression left on my mind was that it is heard at all times of the year, but this, as well as the fact of its being altogether inaudible during the cold weather in all parts of the two districts in question, should be tested by due inquiry and accurate observation before they are accepted or rejected for the purpose of ascertaining the cause of the phenomenon.

I was hitherto under the impression that the sound is not audible at Khulna, as it was never noticed by me although my stay there extended over 9 months (May to December) in 1863, and 17 months in 1869-70: but I observe that it is and has been heard there. My friend Babu Bunkim Chunder Chatterjee, who was in charge of the Subdivision for several years, writes me to say,

"Rainey is right after all. I remember very well that I used to hear the Barisaul guns while at Khulna. I also remember that they were audible at various places within the Subdivision further east. I distinctly remember that I heard them on one occasion while encamped at Tála on the *Kapataka*. I have always thought the only possible way

of accounting for these noises is to accept the current theory that they proceed from subterranean sources."

I mention this to shew that people are generally indifferent to external occurrences, however curious or extraordinary in their nature, until their attention is drawn by somebody.

The fact mentioned by Mr. Mittra that the sounds are not known at Rungpore should be noted, as it is very near the Teesta, a very big and boisterous river; Mr. Mittra resided there for a long time.

The character of the sounds bears a strong resemblance to the booming of distant cannonade: it is neither like the rattle of musketry nor like the rumbling sound that precedes an earthquake, nor the crashing noise caused by the falling in of large masses of earth. If Mr. Elson had once heard the real Barisal Guns he would have at once given up the idea that they were due to the falling in of the river banks on the bight either of the Hughly or the Baleswar.

I may mention here an incident to illustrate the sharpness—the intensity with which the reports sometimes break on our ears. It was at Bagirhát on a moonlight night at about 9 P. M. that a report like that of a gun struck my ears. My servants had my permission to use my gun to shoot the *pariah* dogs or jackals that infested the compound, I called out to them to inquire what the matter was; they said they did not use the gun, but that it was the Khanja Ali salute.

Referring to the surf theory, it is said "the transmission of sound waves is, however, dependent very much on the conditions under which it takes place, and when these are favourable they travel to enormous distances," but I cannot conceive that the conditions under which sound travels could be so materially different as to render the Barisal Guns distinctly audible at Tumlook, and thoroughly inaudible at Diamond Harbour, almost a seaboard town.

The PRESIDENT read the following letter from Mr. H. J. Rainey on the subject:

RAINEY VILLA,
Khulna, Feb. 23, 1888.

DEAR SIR,

I have heard that at the next meeting of the Society a paper will be read on the so-called "Barisál Guns": I have for many years taken a great interest in the subject, and as I do not think it is at all likely that a satisfactory solution of the physical phenomena can be arrived at without a series of independent observations from various places in the districts where the sounds are heard, I would suggest that printed forms stating the several points on which information is desirable, should

be circulated to the several meteorological stations where the "Barisál Guns" are likely to be heard, and to all residents in such localities who may be expected to assist in the investigation.

If you will refer to one of my articles on "Jessore" published in the *Calcutta Review*, Vol. LXIII, p. 7, you will find that Mr. H. F. Blanford of the Meteorological Department, the then Secretary of the Society, forwarded to me such forms for circulation, but though some of my friends were good enough to promise to assist in the enquiry by recording their observations, yet not a single return was sent to me. The Society, however, acting directly with public and private persons, if it resolves to do so, is likely to meet with success.

I may add that I shall be very glad to assist in any way in investigating the matter if my aid is at all necessary.

Yours faithfully,
H. J. RAINEY.

In continuation the PRESIDENT said that the Society were much indebted to Babu Gaurdás Bysack for having again brought this interesting subject before their notice, and the paper is particularly interesting because it gives additional names of places where these sounds have been heard. It was much to be regretted that former efforts of the Society to elucidate the origin of these curious sounds had been unsuccessful, and that during the 18 years that had elapsed since the subject was discussed at the Society's meetings no new facts had been brought forward regarding them. In the absence of more definite information than already existed, it was difficult to see in what direction further enquiries could usefully be prosecuted.

As it might be interesting to the meeting he had drawn up a short memorandum of the facts already recorded regarding these mysterious sounds.

First as to the sounds themselves:—Most observers agree that they resemble the reports of guns fired or explosions at a distance. Sometimes the sound is dull, at others loud enough to wake a person from sleep. They are heard sometimes singly, sometimes in rapid succession or at intervals, occasionally lasting for several hours.

In his paper on the "Antiquities of Bagirhát" (Journ. As. Soc. Beng. 1867), Babu Gaurdás Bysack describes it as a dull roaring sound, as of the booming of distant cannonade, which is said to be fired by aerial bands in honour of Khanja Ali, or Khán Jahán, who was tehsildar of Bagherhát some 400 years ago.

Mr. Pellew says the noise exactly resembles the sound of surf as heard by him at Púri, when, on account of the cessation of the S. W.

Monsoon, the swell rises to an unusual height before breaking and then breaks simultaneously for perhaps a length of 3 miles of coast, the succession of reports being caused by the breaking of successive waves along the beach.

Mr. Beveridge has referred very fully to this phenomenon in his "Account of the District of Bakarganj." He says the sounds are heard like the discharge of cannon in Bakarganj, and part of Dacca, Faridpur, and Jessore at the beginning of the rains, *i. e.*, in May and June. At Barisál the sound comes from the S. and S. W., and is generally heard in a south wind and before rain. It is sometimes heard only for a minute or two; sometimes it continues for one or two hours, at intervals of two or three minutes between each discharge. It seems to be heard usually in the evening or at night, but perhaps this is only because the attention is more drawn to it in the absence of other noises. It has been supposed by some that the sounds are merely those of guns fired at marriages; by others that they are caused by the falling in of the river banks. But they are heard away to the south, among the Sundarbans where there are no marriages, and where there are no high river banks to fall in. They are heard down at Kúkri Múkri, the most southerly island in the district, and the Maghs there say that they are distinct from the noise of breakers or of the tide coming in. The natives say it is the sound of the opening and shutting of Ravan's gates in the Island of Lanka (Ceylon), which fiction, as Mr. Beveridge remarks, is valuable because it shews that the sound comes from the south. And he concludes by saying that it is not altogether impossible that it originates in that curious submarine depression in front of Jessore and Bakarganj which is known by the name of the "Swash of no ground."

In another part of the same work Mr. Beveridge records that he was told by a native of Kúkri Múkri that the sounds were sometimes heard from the north,—south, and south-west. The statement as regards their coming from the north is important because they are nearly always reported as coming from the south.

Captain W. J. Stewart, of the Revenue Survey, describes the sound as similar to the noise caused by the explosion of torpedoes under water, but at a great distance.

Mr. H. J. Rainey says the sounds resemble the report of cannons or loud explosions heard at a distance. Occasionally the reports are heard 3 or 4 times in rapid succession, while at others a minute or two intervenes between them.

Mr. Westland heard them at Jessore during the night, exactly like the distant firing of cannon occurring in single detonations and at irregular intervals.

Other observers record them as occurring at intervals of a few seconds.

The sounds are heard not only at Barisál, where they are very distinct, but over the whole delta of the Ganges from the Húghli to the Megna. They are recorded from Cherra Punji, but do not appear to be generally heard further north than Dacca and Faridpur, and are not heard at Balasor. Sir W. Herschel says he never heard them spoken of as occurring at Kushtia, Rajshahaye, Nadiya or Maldah.

It is curious to note that the sounds are somewhat capricious, being frequently heard at certain places, but not at others close by.

They appear to be almost invariably heard from a southerly direction. According to Mr. H. J. Rainey they are quite independent of the direction of the wind and come from the south and south east directions, after a heavy fall of rain, or cessation of a squall and while the tide is rising. Captain Stewart says they are always heard in Barisál from one direction, and there and at Kúkri Múkri, Chapli Chur, Tiger Point and other places in the Sundarbuns he noticed the sounds always from the direction of the depression known as the "Swash of no-Ground," and from the fact of the direction being always the same he argues against the sounds being caused by the falling in of river banks, falling of trees or firing of bombs.

Mr. Beveridge says that at Barisál the sounds come from the south and south-west, and are generally heard in a south wind and before rain. At the Island of Kúkri Múkri they are said to be heard from the north, south and south west, and to be quite unconnected with the bore, the tides, or the surf.

Mr. T. R. Sarr reports their occurrence at Luckipara Factory, district Jessore, on the 28th June 1871, between 5 and 6 P. M. from the N. W., the direction of the wind being S. W. Reports sudden and momentary like bombs.

The sounds are said to have been heard at all hours of the day or night, though more often in the stillness of evening or night. Mr. Sarr reports them as occurring principally through the day.

They appear to be usually observed during the hot weather and rainy months from March to September. Mr. Sarr heard them near Jessore in May and June only. In 1870 they were frequent; in 1871 few and far between.

Captain Stewart heard them in the Sundarbans in March 1862 and again at Chapli Chur, on the Sea-face, in March 1863, as well as in April and May at Barisál.

Mr. Rainey says they are only heard during the S. W. Monsoon and rainy season.

They appear to be heard more distinctly after rain or in the lull after a squall, but are also recorded as occurring before rain.

Several theories have been brought forward to account for these sounds, and among them the principal are:

(I.) The breaking of enormous surf rollers on the shores of the upper part of the Bay of Bengal; the sound of this travelling inland along the surface of the rivers, and to long distances under the favourable atmospheric conditions of the S. W. Monsoon.

(II.) The breaking down of the banks of the rivers in the vicinity of places where they are heard.

(III.) The firing of bombs or guns on the occasion of marriages.

(IV.) Subterranean or sub-aqueous volcanic or seismic agencies.

(V.) Atmospheric electricity.

Also by the bursting of bamboos or the falling of trees in the jungles. The evidence hitherto recorded, however, in support of these possible causes is altogether insufficient to warrant our attributing the sounds to any one of them.

It is evident that the first theory is dependent upon the proximity of the places where the sounds are heard to the sea coast or to rivers along which the sound could be carried.

Now we find that they are heard in nearly all parts of the Gangetic delta, a tract of almost absolutely flat country bordering the extreme north-western corner of the Bay of Bengal, extending from the Húghlí to the Megna, and intersected by innumerable streams and water-courses. They appear to be most common along the course of the Megna, but have also frequently been heard along the course of the Haranghatta about the middle of the Delta.

Babu Gaurdás Bysack records that at Bagirhát, on a tributary of the Haranghatta at a distance of about 56 miles from the open sea, they are heard at all times of the year, particularly when the weather is calm and the sky clear. They are most distinct after a storm or heavy shower of rain.

At Barisál, on the Baleswar River, about 34 miles from the sea, they are equally prominent, and are heard all over south Jessore and Bakarganj, at least in the neighbourhood of the Baleswar River, and extending to the foot of the Chittagong Hills. Mr. Pellew, who has given a good deal of information about them, says he has not heard them himself west of Morellgunj on the Haranghatta, about 42 miles from the sea, though Mr. Rainey has recorded them at Khulna, which is situated at the confluence of the Bhairab and Rupsa rivers, about 60 miles from the sea.

Babu Gaurdás Bysack has, however, recorded the curious fact that

though the sounds are heard at Baghirhát they are not heard at places near there, nor in other parts of the Sundarbans equally distant from the shores of the Bay and where the surf is equally violent.

In the 'Proceedings' of the Society, for August 1870, Mr. Rainey records that these sounds are heard as far north as Faríḍpur on the Padda River, about 104 miles from the nearest point of the sea coast at the mouth of the Tetulia river.

Mr. Dall also heard of them occurring at Faríḍpur, like discharges of artillery 3 or 4 miles away and loud enough to wake a person from sleep.

Captain Stewart writes that his assistant, Mr. N. T. Davey, constantly heard them in District Húghlí, as well as at Faríḍpur.

Again, in the 'Proceedings' for November 1870, Mr. Pellew records their occurrence on the Saplenga river in the Sundarbuns, about 30 miles from the coast. They were loud enough to wake him up and were heard on 4 or 5 different occasions the same night. The sound came from the south and could not have been marriage guns because the country to the south was all forest.

He also mentions that at Púrí, when the S. W. Monsoon has lulled, he has seen far to the south a very lofty wave break with a distinct booming noise, a second or two after another nearer, then one opposite to him, and then others towards the north as far as one could see. "Even to one standing on the beach, the noise of these waves (except the nearest) was so like that of guns that we used to remark on the resemblance." When the wind was blowing strongly the wave was turned over by the force of it, before it attained its full height; but when there was no wind or a slight breeze from the shore, whilst the swell was still high from the effect of the monsoon, this phenomenon often occurred, the wave rising to an immense height and breaking over a mile or two of beach at one moment. He contends also that to a person close by the sound of each wave would appear continuous; but to a person 40 or 50 miles away it would be a boom like that of a gun. He further remarks that the wind blows very obliquely at Purí and would not take the sound so far inland as at Bakarganj.

In the same 'Proceedings' Mr. Rainey records that the direction of the sounds appears to travel invariably along the course of the streams that discharge themselves into the Bay, and that when he was living at Khulna, which is at the confluence of the rivers Rupsá and Bhoirab, he noticed that the sounds came from the S. E., while when he lived on the other side of the Rupsá, on the west side of it, the noises were heard from the S. W. Again he lived at a place called Nali—or Schillerganj, on the Baleswar river and to the east of it, when the detonations were

heard from the S. W. At Schillerganj, which is distant about a tide from the open sea, the sounds were heard much louder than they were at Khulna, while below that point, as far down the Haranghatta river as a boat could venture out in the S. W. Monsoon, he heard them with even still greater precision, but the reports were quite as distinct then from one another as they were elsewhere, and he considers this as not bearing out Mr. Pellew's surf theory.

In the paper we have just heard read Babu Gaurdás Bysack records that similar sounds are heard at Támlúk on the Rupnarain river in the estuary of the Húghli, about 50 miles from the sea and only about 36 from Calcutta. Also that Mr. Medlicott had told him of their being heard at Cherra Punji, which is about 200 miles from the coast at the head of the Bay, and that a friend of his had heard them in Bikrampur near Múnshíganj, about the confluence of the Megna and the Padda rivers, some 104 miles from the coast, but never in Dacca.

It will be noticed that many of these places where the sounds are undoubtedly heard are at a great distance from the sea-beach, and further than one would imagine that the sound of breaking surf could possibly be heard. The transmission of sound waves is however dependent very much on the conditions under which it takes place, and when these are acoustically favourable they travel to enormous distances. With the exception, perhaps, of Cherra Punji, none of the stations named are outside the distance at which the sound of guns could be heard, and it is probable that the simultaneous breaking of heavy surf rollers two or three miles in length, as mentioned by Mr. Pellew, would be at least as loud if not louder. Under certain atmospheric conditions the noise might be heard at places a great distance from the sea more distinctly than at nearer places.

It is said that the cannonade at Waterloo was heard at Dover, and other instances are on record of cannon fired during naval engagements in the Channel being heard in the centre of England. Col. Sconce tells me that he heard the cannonade during the siege of Delhi over 60 miles away, and I may mention that when on duty with my battery at Saugor in Central India, between 1860 and 1864, we heard one day the sound of a salute of guns fired at Jubbulpore, over 80 miles away with intervening hills. I do not recollect hearing it myself, but it was the talk of the mess, and, I believe, was verified by letter. The guns used must have been the ordinary old bronze nine-pounders, which would give a sharper report than larger iron guns.

As regards distance, therefore, it seems quite within possibility that the sounds heard at places so far inland could be caused by the enormous rollers of the S. W. Monsoon, especially as it appears from the

evidence recorded that the places at which the sounds are best heard are near the courses of streams running up from the sea and from the direction of the course of the streams, and we know that water is an admirable conductor of sound. During the rains, too, when the sounds are generally heard, the whole country is like a wet sponge, and the air laden with vapour at a high temperature.

At the meeting in August 1870 Mr. Justice Phear, then President of the Society, stated that similar sounds were heard in Cornwall and Devonshire, undoubtedly caused by breaking surf.

It is to be regretted that we have not fuller details of the conditions under which these sounds were heard at Cherra Punji and their direction, but it may be remarked that the station lies exactly in the direction of the upper course of the Megna, and its position on the extreme edge of the hills may in some way be connected with the sounds being heard, if it were possible that the sound of distant surf could be carried to such a distance under favourable conditions.

It seems also possible that the peculiar configuration of the Gangetic Delta and its position at the head of a deep trumpet-shaped Bay, on one side a dead flat and the other lined with fairly high hills, may favour the transmission of the sound of breaking surf inland.

It has been objected by Dr. Mitra that the sounds are not heard in other deltas, such as the Irrawádi, the Mahanadi, the Mississippi, and the Amazon—but in these cases the geographical conditions are quite different. The Delta of the Irrawádi is open on the west. The Deltas of the Sittoung and Salwín reproduce more nearly the conditions, but on a much smaller scale. The Mahanadi debouches into a much wider and more open part of the Bay, the Mississippi into an almost landlocked gulf, and the Amazon into the open sea.

The second theory, that the sounds are caused by the falling in of river banks, does not appear so far to be supported by any direct evidence; the facts recorded by Mr. Beveridge even seem to negative it. It is quite possible, however, that the sounds heard by some observers may be attributed to this cause.

As regards the sounds being caused by the explosions of fireworks or bombs on the occasion of marriages, Mr. Pellew states that the Musalmans of Perojpur and round the Kocha river celebrate their marriages chiefly in September, and always fire off earthen bomb-shells, and it is almost impossible to tell the sounds of these from the Barrisál guns. In another place, however, he says the sound is quite distinct. Sir W. Herschel heard sounds in Dacca which he easily recognised as bomb-firing or could be attributed to it, unless proof were forthcoming that no bombs had been fired within the possible distance. It is not improbable,

therefore, that in some cases the sounds may be caused in this way, though it is certain that they are not the sole cause, as shown by Capt. Stewart's and Mr. Beveridge's statements that the sounds are heard in places where no marriages ever take place and where there are no river banks to fall in, and though the latter further states that his informants at Kúkri Múkri told him that the sounds were quite unconnected with the surf, the bore, or the tide, still these sound-producing agencies existed on or near the spot and might have been instrumental in causing the sounds, though the islanders may not have recognized it.

As regards the fourth theory, that the sounds are due to subterranean or subaqueous volcanic or seismic agencies, there is again no direct evidence, but the current opinion that such is the case and the fact recorded by Capt. Stewart of the sounds being like the explosion of a distant torpedo, and always coming from the same direction of the 'Swash of no-Ground,' when he heard them at Barisál, Kúkri Múkri, and other places in the Sundarbans, seem to point to some submarine source. Mr. Beveridge also suggests their connection with the 'Swash of no-Ground' and the statements he received from natives regarding the sounds being heard at Kúkri Múkri from the south-west, or direction of Ceylon, agree with Capt. Stewart's observations.

Capt. Stewart had an idea that the 'Swash' was the crater of an extinct volcano or submarine volcano and that subterraneous explosions found vent and sound through it, which were heard inland during the south-west monsoon. In the description of the 'Swash' by Commander Carpenter, R. N., of the Marine Survey, (Journal, A. S. B., Part II, 1885), there is no allusion to any such volcanic character, but the formation of the depression is shown to be caused by the convergence towards this region of all the channels through the shoals formed off the mouths of all the rivers of the Delta. The result of this tendency of the ebbing water is a number of whirls and eddies in that locality, the position of the 'Swash' being central with regard to the Deltaic mouths. This constant agitation of the sea hereabouts prevents the mud settling here during the ebb-tides, as it does on the banks on either side, which have thus never been able to meet, and consequently the depth still remains considerable. It would be most important to have further observations as to the state of the sea during the monsoon over this depression, and whether the contending currents cause such disturbance as would produce explosive sounds loud enough to be heard miles inland.

Mr. Rainey has also suggested that the sounds may be of volcanic or subterraneous origin, perhaps the upheaval of land as small islands on the sea-face of the Delta or Sundarbans. He further notes that the sounds travel from the direction of the active volcanic train running

from Chittagong along the coast of Arracan and Akyab. The occurrence of similar sounds at Cherrapunji, as recorded by Mr. Medlicott, would appear more probably connected with volcanic or seismic agency than with any water-borne sounds.

That they are commonly produced by volcanic or seismic causes seems improbable, because these would be accompanied by movements of the earth, which could not escape observation, and none of the observers have noted anything of the kind.

It only remains to consider the possible connection of the sounds with atmospheric electricity and the thunder-storms especially prevalent in Eastern Bengal at the changes of the seasons and during the S. W. monsoon. Distant thunder frequently sounds exactly like the firing of heavy guns far away, and in the case of such sounds being heard shortly before or after a thunderstorm or when thunder clouds were in the neighbourhood, their connection with the thunder would seem obvious unless otherwise accounted for. Such sounds would excite no special attention and might be heard all over the world. It is important, therefore to note that none of the persons who have observed the phenomenon have attributed it directly to thunder, and very few have connected it in any way with electrical action. Nothing, moreover, is recorded indicating any special meteorological or physical conditions obtaining in the Delta which would cause distant thunder to be heard in any very peculiar and unusual manner.

Capt. Stewart mentions that his Assistant, Mr. N. T. Davey, who had taken a good deal of interest in the question, had heard them in district Hughli and also at Faridpur from the southward, generally when the atmosphere was overloaded with electricity preceding thunderstorms. Mr. Davey attributed the sounds to electrical action in an atmosphere surcharged with moisture, as would be the case along the coast. At Faridpur they are heard from over the enormous *bhils* in the neighbourhood, which may also explain their being heard at Barisál and other places.

Mr. Sarr and Mr. Rainey both report the occurrence of the sounds near Jessore in very close weather after heavy falls of rain or squalls, but say nothing about thunder.

I have been unable to find any reference to the theory that the sounds are caused by the bursting of bamboos in the jungles in any of the papers on the subject to which I have had time to refer. This cause would not, however, be peculiar to the Gangetic Delta, as the Barisál guns seem to be, and certainly cannot be the principal cause of the sounds. The same remark applies to the falling of trees.

In the present very imperfect state of our knowledge regarding this

mysterious phenomenon it is impossible to form any decided opinion as to its cause, though from the evidence it would appear that the balance of probability favours the connection of the sounds in some way with the sea; the sodden state of the soil, the vapour-laden state of the atmosphere and the direction of the wind being exceptionally favourable for the transmission of such sounds, which seem to be heard most frequently at times of the year when the sea is at its highest and the contending influences of the river floods against wind and tides strongest. At the same time, some of the evidence seems to decidedly negative this theory, and it is quite possible that more causes than one may be active in producing similar sounds. The more or less intimate connection of the sounds with the river system of the Delta also seems to be established, but whence the sounds proceed there is nothing to show.

As will be seen from the foregoing remarks, the question opens up a very wide and interesting field of enquiry, and it would be very desirable that, if possible, further evidence should be obtained on the subject and a system of observations started on both sides of the head of the Bay, from Balasore to Diamond Island, and at as many inland stations as possible in the districts where the sounds are heard. Copies of the former series of queries referred to by Babu Gaurdás Bysack and Mr. Rainey are in existence, and would form a model upon which a new series of enquiries might be drawn up. I would propose, therefore, that the Council should be asked to refer the question to the Physical Science Committee with a view to arrangements being made, in consultation with the officers of the Meteorological Department, for a series of observations being carried out during the coming monsoon. The numerous meteorological stations now existing in this part of the country would afford much greater facilities for such observations than was formerly the case.* The assistance of the Marine authorities should also be sought in making observations of the state of the sea on the sea-face of the Sundarbans and in the neighbourhood of the 'Swash of no-Ground.'

Mr. T. D. La Touche made the following remarks :—

I have frequently heard the sounds known as the Barisál guns while camping in the south-western portion of the Garo Hills, in Assam. The

* Since the meeting some papers have been discovered containing the replies to the circular issued by the Physical Science Committee in 1871, from Sir W. Herschel, Mr. Westland, Capt. W. J. Stewart, Mr. Rainey and Mr. Sarr. These add considerably to our knowledge of the subject, especially Capt. Stewart's observations in the Sundarbans, and I have therefore thought it desirable to entirely revise this memorandum and complete it as a note of the facts hitherto recorded on the subject.—J. W.

sounds may be heard at any time during the day or night, and always appear to come from the direction of the Brahmaputra, which skirts the western end of the hills. They are heard at considerable distances from the river banks, at least 30 miles in a direct line, over hills and valleys covered with dense jungle; and I hardly think that the fall of a bank of even 30 ft. high could be heard at that distance. They seemed to be most distinct near the village of Mohendraganj at the S. W. corner of the hill area, close to an old bed of the river, but I did not see any banks fall in during the few days I was there. I have heard them only during the cold weather, but I believe they are heard at other times. They can hardly then be caused by heavy surf during the S. W. monsoon, unless different causes could give rise to the same phenomenon.

With regard to the bamboo theory, I have often seen and heard dry bamboo jungle on fire in March and April, when the Garos burn their jhúms, and though the bursting of the bamboos makes a great noise, it is more like the rattle of musketry than the firing of heavy guns and cannot be heard at any great distance, especially when hills intervene.

It has occurred to me that a possible cause of these sounds may be the daily increase and decrease in depth of the water in the rivers of the delta, caused by the tides. It may be that the rising of the waters places the superficial strata in a state of strain, which is relieved when the tide falls, and the consequent earth movements, though slight, *may* give rise to these sounds. This is, however, merely a conjecture, and I do not feel inclined to lay much stress upon it until the subject has been more thoroughly investigated.

MR. ELSON remarked, with reference to what had been read about the Barisál Guns having been heard at Tumlúk on the Rúpnaráin river, that it was just possible the explosive noises were due to the falling in of portions of the high right river bank in Hooghly Bight, a spot peculiarly fitted for the production of the phenomenon, situated immediately at the mouth of that river, at its junction with the Hooghly. The rolling action of the joined streams of the two rivers had so cut away and undermined the bank, that the original raised embankment had in some places succumbed, the bank itself being 'up and down' like a wall, with some ten or twelve fathoms alongside it at low water: and Mr. Elson had himself often witnessed the crashing sound of the falling in of large masses of earth when anchored near this spot; generally at about low water, when the falling tide left the bank without its supporting lateral pressure, the bank gave way and fell. And he believed the sound of these landslips might be conveyed for many miles along a dense water medium: and very possibly distance so altered sound waves through this medium that the noise would not be heard as a loud

splash as those near would hear it, but as a sudden short explosion, a sharp thud, such as he himself had on two occasions been in a position for proving, and resembling the sound of guns, the dull thud, thud, he had heard actually emanating from out the sea on a calm still day from right alongside the boat in which he was at the time, situated about fifty miles from the north African coast, when the French were fighting at Algiers in 1859; or the same peculiar sharp sound of the 9 o'clock gun of one of Her Majesty's frigates at Saugor Roads, heard by him some years ago for three successive evenings, at the Pilot station, some thirty-five miles off, and that against a southerly breeze.

So that, on the whole, the theory of the sounds in question being caused by the falling in of river banks, and of their being propagated even along crooked river bends, should not, Mr. Elson thought, be entirely ignored nor discarded.

MYSTERY OF BARISAL GUNS

APARAJITA BASU

Few people of older generation can still recall the hearing of booming sound popularly known as Barisal Guns that happened occasionally in the southward direction of Barisal district. The mysterious sound was first documented in the District Gazetter of Barisal in 1870. However, no earlier reference including any citation from the medieval Bengali literature was obtained. Since the end of nineteenth century up to the middle of last century people often reported the hearing of bursting sound of Barisal Guns from many places of southern part of Bengal, such as Barisal, Backerganj, Khulna, Fureedpore, Jessore, even from Tamluk and Cherra Punji. Though attempted by the Asiatic Society, Calcutta, no scientific explanation could be produced. Even after so many years the sound is still regarded as one of the top unsolved mysteries of the world like mysteries of Barmuda Triangle, Yeti of Himalaya. However, the East Coast and inland Finger Lakes of the United States, as well as the areas of North Sea, Japan and Italy also experienced such sounds. Also Cochin, China and certain islands of West Indies reported booming noises. No suitable explanation could be given for each and every such sound including that of Barisal Guns.

Eminent Bangladeshi poet Sufia Kamal mentioned the sound in her autobiography and further said that the mysterious bang was last heard in the early of 1950s. The sound generally occurred from February to October, very seldom from November to January.

The Asiatic Society, Calcutta issued a circular in 1886 to its members requesting submission for information all about the sound. However, only fifteen forms were filled up and returned to the secretary. Here is a reprint of the Proceedings of the Society of 1888 where a paper of Bubu Gaurdas Bysack *On Bengal Guns* was found. A discussion over the paper, a letter from Mr. H. J. Rainey were also given in the Proceedings. We hope that the recollection of the excitement among

the members of the Society on a subject that was so interesting can be done even after a time-lapse of more than hundred years. The President of the Society had drawn up a short memorandum of the facts on Barisal Guns so far recorded and placed before the meeting. Babu Gaurdas Bysack in an earlier paper of 1867 narrated it as a dull roaring sound, which is said to be fired by aerial hands in honour of Khanja Ali or Khan Jahan, who was *tehsilder* of Baghirhat some 400 years ago. Mr. Pellow recorded that the noise resembles the sound of surf as heard by him at Puri (Orissa). Mr. Beveridge, a civil servant and researcher on Barisal said that it is not altogether impossible that the sound originates in a curious submarine depression in front of Jessore and Backerganj. Capt. W. J. Stewart of the Revenue Survey described the sound as similar the noise created by the explosion of torpedoes under water. Mr. Westland heard them at Jessore during the night. Sir William Herschel said that he never heard them as occurring at Kushtia, Rajshahaye, Nadia or Malda. The President summed up the possible five reasons behind the sound. These were breaking of enormous surf rollers on the shores of the upper part of the Bay of Bengal; the breaking down of banks of the rivers; the firing of bombs or guns on the occasion of marriages; subterranean volcanic eruption, and atmospheric electricity. We hope that this illuminating publication may revise curiosity again over the issue and ultimately will lead to a solution of the mystery of Barisal Guns.

Tom Stoppard, *The Coast of Utopia, A Trilogy: Voyage, Shipwreck, Salvage,* New York : Grove Press, first published in 2002 (in three volumes), 2007 single volume edition: pp. 347; price: $ 18.

Tom Stoppard's trilogy *The Coast of Utopia* (published in 2002) is a portrait gallery of 19th century Russian revolutionaries heavily imbued with the ideals of German Idealist or Romantic philosophy that seeped into Russia in the 1830s and 1840s and engages with their personal lives and revolutionary endeavours. Reviewing Stoppard's trilogy, Richard Hornby has underscored the value of the work and its relevance in modern times stating that:

> *Utopia* is about radical politics, but it is also about people, long dead and generally forgotten, whose lives have so much to teach us today. All the great political movements of modern times - socialism, communism, feminism, sexual liberation, civil rights, civil liberties - have their roots in the mid-nineteenth century. *Utopia* brings that time back to life for us, and so reminds us of where we have been, and where we are going. (Richard Hornby, "The Stoppard Trilogy", *The Hudson Review,* Vol. 35, No. 4 (Winter, 2003), p. 636).

For authoring his trilogy, Stoppard has drawn heavily from two important works on nineteenth century Russian revolutionaries - Isaiah Berlin's collection of essays in *Russian Thinkers* and E.H. Carr's *The Romantic Exiles.* The assessment of revolutionaries such as Russian Socialist Alexander Herzen, and the founder of the international Anarchist movement Mikhail Bakunin by Berlin and Carr have to a great extent moulded Stoppard's own perceptions about these personalities. Carmen Lara Rallo has drawn attention to the valuable contribution that Stoppard has made to contemporary drama stating that his trilogy is representative of the recent trend in British literature,

> .... in terms of the renewed fascination for history and memory which has become a landmark of British literature since the last decades of the twentieth century ... Thus contemporary drama is marked by a concern for memory and the past which could be linked with the "return to history" that critics such as Frederick Holmes (1997: 11) have identified as one of the defining traits of contemporary British fiction. (Carmen Lara Rallo, "The past will have its time again": History in Tom Stoppard's *The Coast of Utopia* and *Arcadia,* p. 2)

The trilogy was performed on stage at the National Theatre of London in 2002 and at Lincoln Centre's Vivian Beaumont Theatre in New York in 2006 under the direction of Trevor Nunn and Jack 0' Brien respectively.

The first play of the trilogy *Voyage* (1833 to 1843) primarily centres on the Bakunin family and their estate *Premukhino* in the province of Tver in Russia. It traces the beginning of the intellectual pursuits of Bakunin under the guidance of Russian philosopher Nikolai Stankevich that eventually leads him to Berlin where his revolutionary odyssey begins. *Voyage* draws attention to the personal relationships of the Bakunin sisters some of whom are also engaged in Idealistic philosophical discussions. Bakunin's constant interference in his sisters' lives invites the wrath of his father Alexander Bakunin who admonishes his son for having "poisoned" his "sisters' minds with liberal sophistries dressed up as idealism" (Stoppard, p. 53) and for being firmly resolved in his intention to study philosophy in Berlin. Stoppard also brings to the fore Bakunin's relationship with his sister Tatiana for whom he "was blocked by an incestuous love". (Judith Zimmerman, "Tom Stoppard's Russian Thinkers", *New England Review,* Vol. 28, No. 3 (2007), p. 84).

In this play Stoppard highlights the ideological transition in Russia from French Enlightenment (with 'reason' as its watchword) to German Idealist philosophy (that seeks to unite the spirit and the matter, that is, the union with the Absolute) in the early nineteenth century. At a time when "Russia is stuck between dried-up old French reasoning and the new German idealism" (Stoppard, p. 42), this ideological transition makes a powerful manifestation through the conflict that ensues between Bakunin and his father, the latter being educated in French Enlightenment thought.

In *Voyage* the reader comes to know Russia through the eyes of Russian thinkers like Herzen, Russian literary critic Vissarion Belinskii and Russian philosopher Peter Chaadaev who are based in Moscow. On visiting the estate of *Premukhino,* Belinskii launches a scathing attack on the institution of serfdom in Russia when he learns that Alexander Bakunin owns five hundred serfs. Belinskii says, "It's all about how backward Russia is compared to Europe … But in the matter of ownership of human beings we were years ahead of America…" (Stoppard, p. 36-37). These thinkers consider Russia to be a 'backward' country when compared to West European standards and express their

deep concern about the existence of the "evil" institution of serfdom and feudalism in Russia and the repressive policies of the Tsar such as strict censorship imposed on printing organs like *The Telegraph* and *The Telescope* to gag the liberal voices in the country and suppression of incipient revolutionary activities. Belinskii asserts that Russia has "..... 'no history but barbarism, no law but autocracy, no glory but brute force, and all those contented serfs!' – we're nothing to the world except an object lesson in what to avoid" and believes that "literature can replace, can actually *become* Russia!" (Stoppard, p. 87). Aware of the general situation prevailing in Russia, these Russian thinkers also put forward their suggestions with regard to the possibility of initiating liberal reforms in autocratic Russia. Herzen holds that the Tsarist autocracy should be compelled to introduce such reforms "from above" and not "from below" by means of a violent social revolution. Russian philosopher Peter Chaadaev states that the primary cause of the backwardness of the Russians that has made the country "the Caliban of Europe" is that they belong" ... neither to East nor to West, have never advanced with other people in the march of enlightenment. The Renaissance passed us by while we remained squatting in our hovels ... " (Stoppard, p. 80).

The second play in the trilogy *Shipwreck* (1846-1852) revolves around the life of Herzen who travels abroad with his family, Germany being their first destination. Herzen meets his old acquaintances like Bakunin, Russian novelist Ivan Turgenev and Belinskii in Germany. In this play, Stoppard has touched upon an important ideological conflict that ensued in Russia in the early nineteenth century between the *Slavophils* and the *Westernisers* with regard to the path that Russia should follow in order to develop as a nation. Advocates of *Slavophilism* in Russia like Aksakov, spurns Herzen's *Peasant* socialism as "social utopianism" and emphasises that Russia,

> .... can still develop in a Russian way, without socialism or capitalism, without a bourgeoisie, yes, and with our own culture unpolluted by the Renaissance, and our own Church unpolluted by the Popes or by the Reformation. It can even be our destiny to unite the Slav nations and lead Europe back to the true path. It will be the age of Russia. (Stoppard, p. 139)

As a *Westerniser* Herzen harps on the need for Russia to tread the western path to modernisation and considers it to be a viable alternative to *Slavophilism.* He asserts that a European revolution would inevitably lead to the outbreak of a revolution in Russia.

Shipwreck deals with crises not only in the domain of European politics in the mid-nineteenth century but also in Herzen's personal life. The outbreak of the national revolutions of 1848 that end in a fiasco and strengthen the bastions of reaction shatter the hopes harboured by these revolutionaries, most of whom are in Paris in 1848, of abolishing Tsardom in Russia in the wake of the revolution. Despite the failure of 1848 revolutions, in *Shipwreck* the reader finds Bakunin, whose enthusiasm does not peter out, preoccupied with his revolutionary activities. Bakunin, an inveterate champion of freedom also formulates his algebra of revolution, "destruction is a creative passion" (Stoppard, p. 161) and upholds the cause of Pan-Slav nationalism. Herzen who differs with Bakunin on a number of issues criticizes the latter's revolutionary dictum which he considers to be childish and says,

> ... We have to go to the people, bring them with us, step by step. But Russia has a chance. The village commune can be the foundation of true populism, not Aksakov's sentimental paternalism, and not the iron bureaucracy of a socialist elite, but self-government from the ground up! *Russian* socialism! (Stoppard, p. 225).

An important turning point in the play is the amorous relationship that develops between Herzen's wife Natalie and the German revolutionary poet George Herwegh who participates in the revolution of 1848. Herzen's discovery of the illicit relationship of his wife with Herwegh through Herwegh's wife Emma and the death of his mother and son Kolya on their way to Nice from Paris, leave him shattered but he eventually manages to cope with it.

The plot of the third play of the trilogy *Salvage* (1853-1868) develops around Herzen, his family and his journalistic activities in England where his house is frequented by European émigrés and becomes a "home to every shade of political exile". (Stoppard, p. 246). *Salvage* directs attention to Herzen's journalistic contribution to *Kolokol* ('The Bell') edited by him and his friend Nikolai Ogarev and their attempts to disseminate revolutionary ideas in Russia in order to "wake up the intelligentsia, educate the young people". (Stoppard, p. 250). These

journalistic activities however begin with Herzen and Polish radical Count Worcell's endeavour to set up a Polish and Russian press in London. At this time important developments take place in Russia that breathe a fresh lease of life into Herzen. The year 1855 witnesses the death of the despotic Tsar Nicholas I and crushing defeat of Russia in the Crimean war. On acceding to the throne of Russia Tsar Alexander II seeks to deal with the political and moral crisis that the defeat in the Crimean war entails by introducing liberal reforms in Russia, the first being the Edict issued in 1861 for the abolition of serfdom. Censorship and centralised control over the universities are relaxed.

Despite being in England, Herzen constantly engages with Russian problems and wants to propagate revolution in Russia. With the publication of his book *From the Other Shore* in the Russian language his urge to stir the people of Russia into revolutionary action intensifies. He says to his son:

> I put into your hand this protest against ideas which are obsolete and fraudulent. .... The coming revolution is the only religion I pass on to you, and it's a religion without a paradise on the other shore ..... Go in your time, preach the revolution at home to our own people. There they once loved my voice, and will perhaps remember me. (Stoppard, p. 265).

Herzen is a staunch advocate of Russian Socialism or *Peasant* socialism, which he does not consider to be "utopian" as peasants if educated can serve as a potent revolutionary force in Russia.

In the meanwhile Bakunin manages to escape from Siberia and reaches England. Bakunin, the romantic revolutionary and restless agitator engages in conversations with Herzen. Stoppard brings out the romantic temperament in Bakunin and the pragmatism of Herzen through their respective definitions of a 'revolution' and what it means to each of them. For Bakunin, revolution serves as a means of salvation that will unite his inner spirit with the Absolute. Such an analysis has also been put forward by Aileen Kelly's in her book *Mikhail Bakunin: A Study in the Psychology and Politics of Utopianism,* 1982. Bakunin says, "You don't need a country! There's only one revolution, and it's to make man whole again …– spirit and matter no longer in conflict – the Self in harmony with the Universe and soaring free!" (Stoppard, p. 270). Opposing this view of Bakunin, Herzen tries to highlight the

purpose of organising a revolution and its ultimate objective of liberating people from the yoke of enslavement and oppression. He emphatically states, "Revolution is for millions to live decent lives, with equality and justice. It's not for your Self to achieve harmony with the Universe". (Stoppard, p. 270).

Stoppard also brings to the fore a major ideological divide among the Russian intelligentsia of the first and second generations. As a typical representative of the "new men" of the 1860s Russian radical Nikolai Chernyshevsky whose ideas influence the Nihilists and Populists in Russia in the 1860s and 1870s, demolishes the socialist ideas of Herzen, a believer in "progress by peaceful steps" (Stoppard, p. 307) as obsolete. He says :

> You and your friends lived the usual life of the upper classes. Your generation were the romantics of the cause. You liked being revolutionaries, if that's what you were. But with people like me every day was a fight for life - against crop failure, cholera, horse thieves, brigands, huge packs of wolves ... The only escape from misery was to be a drunkard or a holy fool, of which we had many .... .I won't believe in the good intentions of the Tsar or his government. Above all, I won't listen to babbling about reform in the Bell. Only the axe will do. (Stoppard, p. 306).

While Herzen is an advocate of *Peasant* socialism, Chernyshevsky upholds the cause of " ..... *communistic* socialism, with millions sharing the labour and the harvest". (Stoppard, p. 308). Unlike these "new men" Herzen is opposed to the notion of a "revolutionary elite" that would organise and lead the revolution in Russia. An important statement in this context has been made by Zimmerman who observes that, "In Utopia Stoppard has presented us with a view of the Russian past - the civilized moderates struggling against tsarist oppression and ultimately swamped by the new wave of radical ruffians who point the way to Soviet totalitarianism". (Zimmerman, p. 86). This increases the relevance of Stoppard's work in the context of the political developments of twentieth century Russia when the Bolsheviks having assumed powers, established the 'dictatorship of the proletariat' - this 'revolutionary elite' who were firmly entrenched in their position in the totalitarian Soviet government.

In *Salvage* Stoppard draws attention to the developments that take

place in Herzen's domestic realm as well. A German lady Malwida Von Meysenbug arrives at the Herzen house, takes charge of the education of Herzen' s children and observes strict discipline in the house. Stoppard deals with another major crisis that befalls the lives of Herzen, Ogarev and his wife Natalie when Natalie and Herzen get involved in an amorous relationship.

Stoppard's trilogy is an important contribution to the existing fictional and historical literature on 19th century Russia. In the nineteenth century two important fictional works authored (that are available in English translations) were Ivan Turgenev's *Rudin* (1855) a caricature of Bakunin and Fyodor Dostoevsky's *Devils* written in the early 1870s. While Turgenev's *Rudin* belonged to the Russian intelligentsia of the first generation, Dostoevsky's *Devils*, Nikolai Stavrogin and Pyotr Verhovensky were Russian radicals of the 1860s or the 'new men'. Stoppard's work not only deals with the Russian intelligentsia of the early nineteenth century but also takes into consideration the ideological rift between the two generations of Russian intelligentsia. In this regard Stoppard's work bridges the gap between the earlier novels. It traces a significant ideological shift from Idealism of the early nineteenth century to the extreme radicalism characteristic of mid and late nineteenth century. However, in his Introduction to the 2007 one-volume edition of the play, Stoppard admits that in the first three volume edition he had made an unbalanced assessment of Bakunin which he sought to rectify to some extent in the second revised edition of the trilogy (2006) when the play was to be performed on stage in New York. His heavy reliance on the works of Carr and Berlin has led him to be influenced by their understanding of Bakunin as a romantic rebel and a relentless agitator who believes in revolutions and cannot be considered a serious thinker. Stoppard presents Bakunin to the readers as a "courageous, inspiring, big-hearted and tireless" (Stoppard, p. xiii; Introduction) revolutionary whose,

> ... way of jumping from one enthusiasm to another, his erratic pursuit of mutually contradictory goals and his staggering metamorphoses between intellectual analyst and romantic idealist, and back again, are a challenge to those who would like to admire him as a thinker. (Stoppard, p. xiv).

Stoppard states that such an assessment has largely been conditioned

by his admiration for Herzen, his "hero" whose perceptions about Bakunin and his radical ideas have been instrumental in shaping his own views about the latter. He writes that later he "began to question his treatment" of Bakunin. Somewhere, Stoppard has the "sense" that he has "let Bakunin down .... undervalued him". (Stoppard, p. xiv, Introduction). As a corrective measure, Stoppard mentions that he wrote some "new lines" for Bakunin in *Salvage* in 2006. *Salvage* is particularly important for the conversation between Herzen and Bakunin through which Stoppard tries to bring to the fore the conflict between Herzen's pessimism and Bakunin's optimism and belief in the virtues of mankind. Stoppard presents Bakunin to his readers as an Anarchist who talks of the need to demolish any form of "Order" or "Social organisation" (Stoppard, p. 268) as a necessary pre-condition for the liberation of man's (inner) "spirit" that he equates with true revolution. Herzen does not attach any importance to Bakunin's utterances because he thinks that they carry no "meaning, let alone a political idea, let alone a course of action". (Stoppard, p. 161). This seems to be an unfair projection of the image and ideas of the founder of the international Anarchist movement who is repeatedly snubbed by Herzen. Stoppard's trilogy does not deal with the ideas and activities of Anarchist Bakunin extensively especially in the context of his ideological conflict with Marx within the First International in the late 1860s and early 1870s that provided a concrete shape to his Anarchist thought.

Barring the treatment meted out to Bakunin, Stoppard in *Utopia* successfully brings to life revolutionary characters of nineteenth century Russia who despite being far away from their homeland relentlessly strive to transform their autocratic country into a liberal one. Some of these revolutionaries, the Russian Nihilists, according to Herzen, live a Utopian dream of creating everything anew on the ruins of all that exists at the present moment. They try in vain to build a "perfect society where circles are squared and conflict is cancelled out. But there is no such place and Utopia is its name .... Our meaning is how we live in an imperfect world, in our time. We have no other." (Stoppard, p. 347). Stoppard's "hero" Herzen is not a Utopian. At the end of *Salvage* he criticizes these Russian Nihilists as "disappointed conservatives" who fail to understand that in order to exist in this "real world" man has to make use of the chances that life offers him rather than dwell in his Utopian world, as the "real world will usually triumph over the ideal". (David Wohl, *Theatre Journal,* Vol. 55, No.2 (May, 2003), p. 352).

Saptadeepa Banerjee

Anup Taneja, *Gandhi, Women, and the National Movement, 1920-47,* Har-Anand Publications Pvt Ltd : New Delhi: 2005, pp. 244, price: Rs.395.

Anup Taneja's analytical research provides a critical estimation of Gandhi's success in mobilizing and motivating women to participate in the national movement. Taneja argues that the mass movement started by Gandhi in the 20s of the 20th century, that followed in the decades of the 30s and the 40s formed a critical as well as a formative stage in India's Independence movement. Taneja shows that one important aspect of Gandhian movements was active participation of women in politics. The book intends to focus on how Gandhi's charismatic call drew forth women into politics. Taneja also focuses on Gandhi's views and notions about a woman's role in household and society. He highlights that there was a tendency among many women to occupy the central stage in the main political currents of the 20s, 30s and 40s of the 20th century. Taneja through his study shows that Gandhi was the main protagonist of the political movements of the time, so the issue of women's participation therefore veered around or against Gandhi.

The book is divided into six major chapters. In the Introduction, entitled 'The Pre-Gandhian Phase' Taneja gives a detailed account of the position and condition of women in Indian society prior to Gandhi's arrival in Indian nationalist politics. The author shows how the various social customs that existed in Indian society like the *purdah* system, child marriage, dowry, *sati* and ban on widow remarriage hampered and restricted the all-round development of Indian women. Taneja highlights that the movement for women's education and emancipation developed along with the social reforms of Rammohan Roy and Vidyasagar. He highlights the role, ideology and efforts of social reformers, various women's organizations, journals and magazines in the early nineteenth century for improving and elevating the status of women.

The first chapter, entitled 'Gandhi's perception of women' focuses on the influences that helped form Gandhi's notion about women. In this connection Taneja shows the influence of Gandhi's 'deeply religious mother and wife or his effeminate character' that contributed to a certain extent to the shaping of his views about women. Taneja deals with the various ideologies of Gandhi that he constructed to involve

women into the national movement. He suggests that Gandhi feminized his politics, represented it by the symbol of *Sita*, the character that he deliberately projected as a role model for women in order to engage them in the national movement. Taneja argues that Gandhi's preferred example constituted the epitome of ideal womanhood possessing virtues of kindness, sacrifice and suffering perfectly suited to his non-violent movement. Taneja highlights another important aspect of Gandhian ideology which was to remain and believe in the concept of celibacy. The book argues that an alternative to Gandhian non-violent movement symbolized by *Sita* was provided by Nehru when he chose the symbol of *Chitrangada* for involving women.

In the third chapter, 'Non-Cooperation and Khilafat campaigns (1920-22) and women's mobilization' Taneja deals with the causes and conduct of these two movements and focuses on the manner and extent of women's involvement in these movements. Taneja shows how Indian women were mobilized by Gandhi and more specifically focuses on the various activities he envisioned for women in the freedom struggle. In this connection he highlights the role of the *charkha* and *khadi* as these were intended to be instruments of women's emancipation which in turn also served as channels through which women contributed to the national movement.

In the fourth chapter entitled, 'Civil Disobedience Movement and the Role of Women' a comprehensive account of the activities of women in different regions of India has been provided. Taneja provides a detailed account of the activities of the well-known women leaders. He through his study shows how women's dynamic participation in this movement forced the colonial government to formulate various strategies in order to suppress and subdue women agitators. Taneja also focuses his study on some non-Gandhian women nationalists who could not agree with Gandhian notion of non-violence and passive womanhood. Nor could Gandhi accept the militant women who fought through a different channel of the freedom movement having an altogether different concept of winning freedom.

The fifth chapter entitled, 'Women and the Congress Movements, 1935-47' gives a detailed account of the activities of women in

Individual Satyagraha and the Quit India Movement. Taneja analyses the role of some radical women leaders like Aruna Asaf Ali, Usha Mehta, Satyawati and others. Taneja argues that an alternative to Gandhian non-violent movement symbolized by *Sita* was provided by Subhas Bose when he created the *Rani Jhansi* Regiment for involving women. Taneja also mentions the role of Captain Lakshmi Swaminathan, the commander of 'Women's *Rani Jhansi* Regiment'.

In the concluding chapter entitled, 'The Assessment' Taneja provides a critical analysis of Mahatma Gandhi's role and his ideology as a national leader. Taneja points out that compared to women's unprecedented participation in the Civil Disobedience and Quit India movements, women's activities in the Non-cooperation movement had been inadequate and restricted. He, while searching for reasons behind the unprecedented participation of women in Gandhian movements refers to religion as a vital force behind women's mobilization. He stresses that the freedom struggle was associated with *desh puja* and along with it the saintliness of Gandhi acted as major mobilizing agents. Taneja points out that the assumption of this patriotic struggle as a religious mission enabled Gandhi to combine feminine role with nationalist politics. Taneja shows that Gandhi's attempts at involving women in the national movement had both ideological and practical reasons as their involvement meant involving every home in India in the freedom struggle.

Taneja shows that Gandhi ensured women's participation in the national movement through the *khadi* programme and associated spinning with the spiritual regeneration of India. The book brings to focus Gandhi's brilliant strategy to involve women in spinning and *khadi* by constant use of the themes like 'protection, female nakedness and shame'. Taneja highlights Gandhi's association of *charkha* with the female body. He enquires that behind this constructed association between the two lay Gandhi's politics. Through this assimilation Gandhi criticized the consumption of foreign goods which had stripped off clothes from Indian women, thereby strengthening the importance of spinning. According to Taneja, this female nudity was emphasized by Gandhi who underscored that the only solution that can save India from the 'fetters of bondage' and shame of being

stripped naked was the spinning wheel. Taneja shows how Gandhi associated spinning with terms like dignity and honour which would eventually facilitate the process of women's emancipation. He points out that for Gandhi spinning and weaving were religious acts suited to women's gentle nature. The book highlights that Gandhian perception of women with regard to providing them with an equal status got restricted within the religious sense of the term. The *khadi* programme was seen as a mere extension of women's domestic roles. The book shows the manner in which Gandhian ideology of associating women with spinning subjected them to a new kind of patriarchy overlooking the question of women's emancipation. The Gandhian conception of women never welcomed the idea of women joining as civil protesters even though he approved picketing. To Taneja, Gandhian conception and concern about women and their sexuality was governed by his typical middle class background where home and husband came ahead of nation.

The book is a product of exhaustive and meticulous research work. It has used a wide range of materials, government and official sources, oral narratives and secondary sources. The book provides an informative and detailed account of women's role and participation in the Indian freedom struggle and opens up many areas of interest that demand further research.

Women's involvement and contribution to Gandhian movements is an extensively researched area and an immensely interesting field of study. There exists innumerable works on the various aspects of Gandhi's engagement with women. There exists a body of writing on women's participation, 'both Gandhian and revolutionary' in the national movement. The book offers nothing innovative pertaining to this field of study and is basically a compilation of various accounts of women's involvement. The book has essentially dealt with the role of prominent women leaders and has sidelined from its domain the role and activities of ordinary women. Nevertheless the book makes a major contribution in enriching the existing literature on women's participation in Gandhian as well as in non-Gandhian movements. The book is a valuable piece of work for the students of history, gender studies, women's history as well those interested in feminist studies.

Rini Goswami

Aparajita Basu, *Bharate Bijnan O Prajukti : Madhyajuger Shes Parber Itihas (1206-1833),* K. P. Bagchi & Co., 2017, Kolkata, Price : Rs. 520/-, 348 Pages.

The dialogue between historians and scientists is not very common in the academic arena of the past. But those days have gone. Now the conversation between the practicing scientists and historians has started. This dialogue is very significant in the field of history of science, where both have a major part to contribute. While tracing history of science in *Bangla,* the major initiatives were taken by the scientists. The process was started by Samarendranath Sen, a scientist, whose birth centenary is being celebrated in this year. He wrote *Bijnaner Itihas,* a magnus opus. The first volume of which was published in 1955, that was followed by the second volume, released in 1958. He tried to trace the history of science in broad spectra of time and space. It was on the development of scientific inquiry since ancient period in India and Europe. First volume traced back prehistoric period, the survey was on the first development of science in ancient civilizations like Egypt, Babylon, Vedic India, China, Greece, Alexandria and Rome. Second volume explored the history of Indian science in post-Vedic period, Arabic science, science during European renaissance and study ended with the emergence of modern science.

It has to be noted that in the same decade an important book was written by John Desmond Bernal (1901-1971). Name of that book was *Science in History* (1954). Before that Bernal wrote another significant book, namely *Social Function of Science* (1939). No discussion will be complete in the arena of history of science without mentioning Bernal. However, in this discussion we are focusing on the history of science, written in *Bangla.* Thus without elaborating Bernal's study let's mention a book that was published in 1997. Interaction between historians and scientists was evident in that book, where both practicing historians and scientists had tried to trace the history of science in India. The name of that book was *Bharater Itihase Bijnan O Prajukti.* That book was the proceedings of a workshop, which was organized by two noted organizations of West Bengal, who are devoted to the ideal of using *Bangla* in academic studies. Those two organizations were *Bangiya Bijnan Parisad* (1948) and *Paschimbanga*

Itihas Samsad (1978). I remember nearly two decades ago I had an opportunity to write a review on that book in a *Bangla* daily of Kolkata. The whole story came to my mind because I have a book on my desk for reviewing, written by a person, who was none other than the one, who had edited the book *Bharater Itihase Bijnan O Prajukti.* The new book, which has come to my hand is the book written by Aparajita Basu. The book is on history of science and technology in the last phase of medieval India. The name of the book is *Bharate Bijnan O Prajukti: Madhyajuger Shes Parber Itihas (1206-1833).*

In the foreword of the book, the author elaborated his plan of writing this book. His project is of writing two volumes on the theme. The first volume, which is in hand of the present reviewer, is on medieval science and the second is on technology. The present volume has four parts; namely mathematics and astronomy, medical science, life science and physical science. Basu opined that he would like to discuss the growth of science in the time specificity of 'medieval era', the time line of which, to him is between 1206 and 1833. The year 1206 was the year of beginning of Sultanate; in that year Qutubuddin Aibak, the Turk ruler ascended the throne. The endpoint is 1833, when the monopoly right of the English East India Company came to an end. The year signaled the sojourn of the aggression of British industrial capital. However, one may question can the long period of nearly six centuries be considered as the last phase of medieval period? Without mentioning any particular period the author may mention the timespan of his study in a straight jacketed manner. Periodisation is a complex matter in historical discursive. There are diverse opinions among historians in indicating a particular year as the beginning of a period or as last phase of a specific period, Basu himself did not confine his study within the given timeframe also. While tracing the history of the development of mathematics and astronomy in India he traced back from the time-period of Aryabhatta (born in 476 A.D). He has rightly mentioned that since fifth century A.D Indian mathematics and astronomy did excel, where Aryabhatta, Brahmagupta and Bhaskar II did contribute a lot. With this backdrop, he has started his discussion on mathematics and astronomy during the time of Sultanate. There he has mentioned the interactions among

Arabic, European and Indian science. Translation of knowledge text was an important phenomenon in this field. Basu emphasized on both mathematical and observational studies in the development of Indian astronomy. He thus discussed the history of establishing observatory in general and role of Sawai Jai Singh in this endeavour in particular. The usage of astrolabe during the reign of Firoz Shah Tughlaq, observation of meteor by Mughal king Jahangir are some of the interesting things, which readers of this book would love to know. However the major contradiction in the development of astronomy in pre-modern India was that the study of astronomical science was mostly determined by religious orthodoxy. This important study was used for foretelling. Astronomy and astrology was used as synonyms. This limitation deserves special mention because we are inheriting this legacy as we notice in contemporary society that even the educated persons are depending on astrological predictions and various remedies to combat the probable problems of future. This important aspect has been aptly addressed by Basu, though he himself has inadvertently used two words in same breath sometimes. He has pointed out that both Hindu and Muslim scholars did not have the mind to welcome new ideas clue to conservatism. Superiority complex among Indians was one of the major obstacles to the development of astronomy.

The second portion of the volume is devoted to medical science. Like astronomy, here author has tried to trace the origin of Indian medicine from the ancient time. He has commented that the golden age of studying ayurvedas came to an end before the coming of Turk-Afghan rule in India. However he has felt the necessity to narrate the contributions made by Aatreya, Caraka and Susruta. He has considered Caraka and Susruta as individuals but Debiprasad Chattopadhyay was of the opinion that Caraka was a group, who gathered experience of medicinal studies by travelling from one place to another. Same thing is applicable to Susruta. They were good listeners; they transferred their medicinal knowledge to others. Basu has beautifully analysed the theoretical foundation of ayurvedas. Along with ayurvedas, Basu has discussed siddha system of medicine which was developed in ancient period. During the period under review Basu

mainly described unani medicine. He has thrown light on the status of ayurveda during medieval period. Description of some texts on medicine and few personalities connected with medicine is noteworthy. The author also investigated the influence of Hinduism, Buddhism and Islam in the field of medicine. The discussion on the development of medicine has been traced till the coming of European physicians into India.

The third part of the book is concentrated on life science. There the author evaluated both the studies on flora and fauna. With a brief introduction on the early phase of botanical studies in India Basu narrated botanical and zoological studies in medieval India, with special reference to Mughul period. In a proper historical analysis he has explored Europeans' role in this field.

The last part of the book is on the development of physical science. There the author has tried to evaluate the contribution made by Islamic scholars along with the Hindu pundits. The study of geography was an interesting one, where Europeans were naturally interested. If we study the development of colonial science in India then certainly we find that the colonial powers were attracted to the study of surveying, botany and medicine for their own economic and political interest. The book, written by Basu has nicely analysed the backdrop of that development. Basu has tried to cover a huge area in this book which should be congratulated. However, that is one of the limitations of this book. Describing the development of science in our country, the author has elaborated his discussion beyond the purview of his study. May be he has done so to make the readers comfortable in understanding the theme.

On a whole it can be said that the book is worthy to have in one's possession. An introduction by noted medieval historian Professor Aniruddha Ray, a number of relevant colour plates aud a rich bibliography added the value of the book. Being a retired college teacher of chemistry, Basu has taken the challenge to trace the history of science in medieval India. He has succeeded to a great extent.

Sabyasachi Chatterjee

Rangan Kanti Jana, *Kanchannagar : Cutlery Obsolescent Indigenous Technology*, Kolkata, Institute of Historical Studies, 2017, Price : Rs. 300.

My first introduction with Kanchannagar recollects the memory of our Geography teacher who taught me the past glory of this suburb centre of Bardhaman. While my three decades of service in one of the most modern steel plants located in erstwhile district, I overlooked our pre-modern technology. This lacuna to reveal the glory of our past has taken care by Dr. Rangan Kanti Jana who is a devoted scholar on the various aspects of indigenous technology. The location of the site has been well studied by the scholar from geographical as well as historical aspects. The site revealed coins of Pre-Kushana to later Mughal coins, late Medieval Mosques of sixteenth century and several other antiquities.

A continuous iron and steel making practices are noted from Pandurajar Dhibi of this district. In case of Iron technology this district traced the beginning of iron from third millennium before present. Archaeometallurgical investigations have revealed the beginning of iron technology in this part of Bengal. Initially iron began in the late Chalcolithic period but it took a few centuries to attain perfection in iron technology. The iron smelting activities are attested by the remains of furnace, slag and ore along with the finished and semi-finished products of iron. In the beginning, iron was simply extracted, but subsequently, the carburizing process of steeling further increased the strength of the iron tools and implements. The process of carburization was noted at the site of Hatikra in the Birbhum district. The analysis highlighted the development of iron technology from mixture of ferrite and slag to tempered martensitic structure in third century BCE, as revealed in a sickle excavated from Pandu Rajar Dhibi.

The technology of iron and steel making in eastern India has flourished not for making arms but giving overall support to agriculture as well as the economic and social demand of this region. Before the initiation of 'permanent settlement' the landlords and chieftains sponsored the service of blacksmiths for supplying spears, swords and other arms for their defense. Those artisans also needed cannons. But those total requirements of arms were withdrawn. The artisans having the knowledge and skills of iron and steel making became jobless. They had to be survived only with firming tools and supplying rims for bullock carts. In that odd situations the local industry were collapsed.

The present scholar has widely studied the rise of cutlery industry-comprising of knife and scissors of Kanchannagar. The cottage industry at Kanchannagar was traced back on the beginning of eighteenth century. The author has found that one individual merchant hailed

from the suburb of Lahore, came to this part of the district, who took interest and sponsored funds to them. That was the cause and beginning of the cutlery making in this suburb. Very soon this new industry flourished. That indigenous technology faced competition with the similar products of Sheffield in British rule.

The author had traced the connection of Gobindo Das Karmakar, the tour companion of Chaitanya Deva for South India. Several other noted artisans were identified by him. He had rightly identified the contribution of Prem Chand Mistri whose efforts made indigenous cutlery industry to be wide-spread over the European Market.

The major contribution of the author is the tracing of the old practices of cutlery industry of that site centering a forge. How it was flourished in nineteenth century represents his minor search. That revealed the source of raw materials together with the making shaping and treating of cutlery specimens. The major thrust is the documentation of the lost process. He has traced the technology transfer from the traditional craftsmen to the artisan of the present days. While studying the operating practices he rightly explained the raw materials, tools and tackles used in the total processing has keenly watched by him. He has given the total process at the same time he has used the terms used by the artisans in vernacular. That has further translated in modern technical language, thus the detail interpretation of technological transfer has been made.

While discussing the operating practices he has not only covered the technology in details along with the available resources — which tackles are available in the market and which are being made by the artisans — but also the detail social position of the artisans have been covered along with the commercial aspects of the cutleries. He has taken interviews of the artisans and followed the latest methodology for interpretation of technology as well as social history.

Thus the author has covered the history of traditional technology for this part of the country for a domain of three hundred years. The indigenous technology has been clearly revealed in the observation of this scholar. The book is thus a great source for the traditional and technological history of the country. This research work is a document of survival technology of late-medieval India. The book has been produced nicely with coloured illustrations.

Pranab K. Chattopadhyay

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Articles in Books :
H.V. Trivedi, "The Geography of Kautilya", *Indian Culture,* Vol. 1, 202ff.

Edited Volumes :
C.W. Troll, ed. *Muslim Shrines in India : Their Character, History and Significance,* Delhi, 1989.

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P. Gaeffke, "Alexander and the Bengal Sufis", in Alan W. Entwistle and Francoise Mallison, eds, *Studies in South Asian Devotional Literature, Research Papers, 1988-1991,* New Delhi/Paris, 1994, 278-84.

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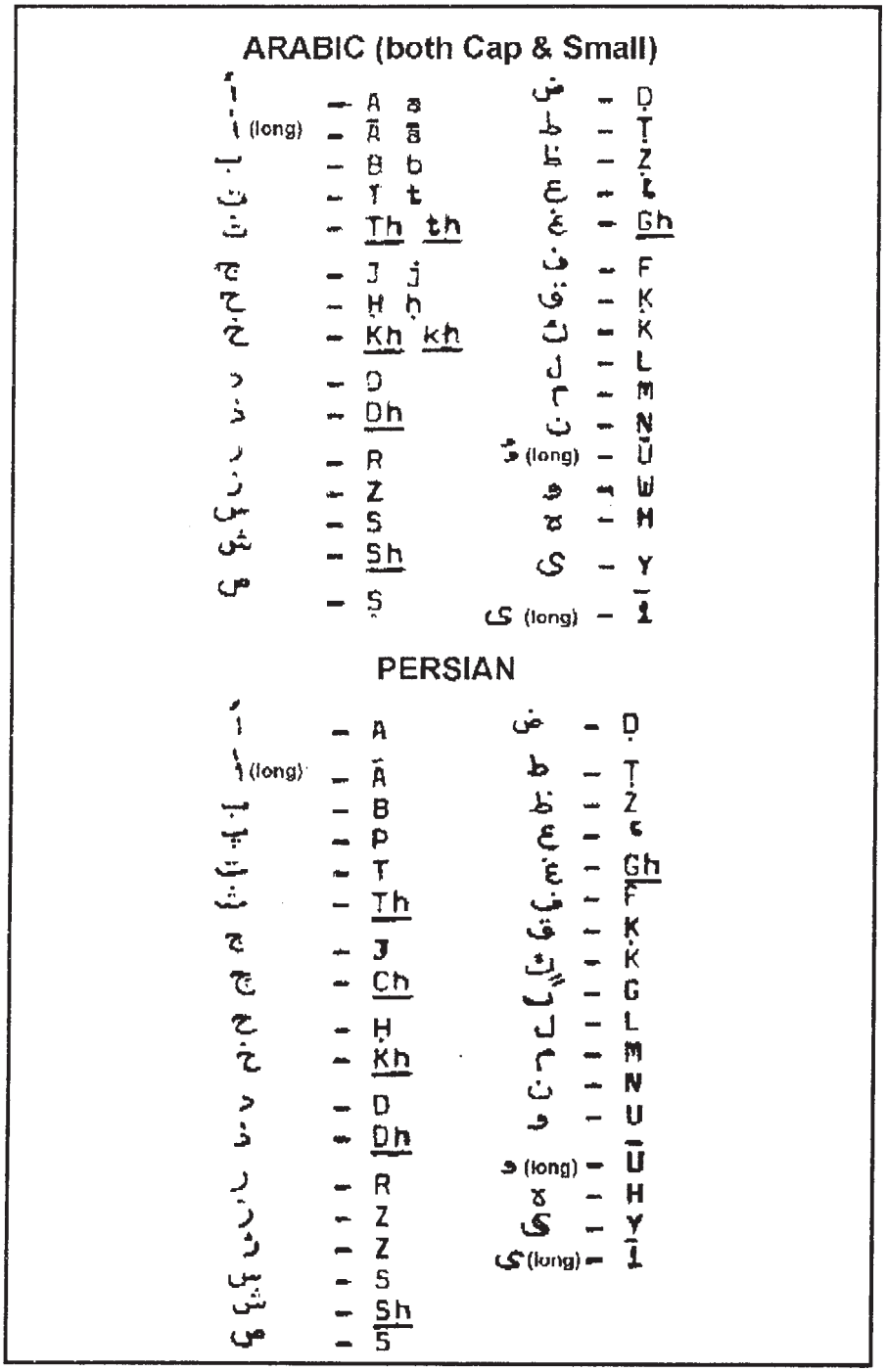
SYSTEM OF TRANSLITERATION

SANSKRIT

आ = ā	ई = ī
ऊ = ū	ऋ = ṛ
ङ = ṅa	च = ca
छ = cha	ञ = ña
ट = ṭa	ठ = ṭha
ड = ḍa	ढ = ḍha
ण = ṇa	श = śa
ष = ṣa	ं = ṁ

TIBETAN

ཀ = ka	ཁ = kha	ག = ga	ང = ṅa/nga
ཅ = ca	ཆ = cha	ཇ = ja	ཉ = ña/nya
ཏ = ta	ཐ = tha	ད = da	ན = na
པ = pa	ཕ = pha	བ = ba	མ = ma
ཙ = tsa	ཚ = tsha	ཛ = dza	ཝ = wa
ཞ = zha	ཟ = za	འ = 'a	ཡ = ya
ར = ra	ལ = la	ཤ = śa/sha	ས = sa
ཧ = ha	ཨ = a		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It will flourish, if naturalists, chemists, antiquaries, philologers and men of science, in different parts of Asia, will commit their observations to writing, and send them to the Asiatick Society at Calcutta; it will languish, if such communications shall be long intermitted; and it will die away, if they shall entirely cease.

Sir William Jones
on the publication of the Asiatic Society

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