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TAGORE, BOSE, HEISENBERG, EINSTEIN

Tagore's Non-theological, Open-ended View of Reality

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tagore emphasized that modern culture should imbibe modern theoretical science as an inalienable part of its *aesthetics*. He was fully aware of the difference between pursuing science *per se* and deriving aesthetic pleasure out of it. Commenting on his friendship with Jagadish Chandra Bose, he wrote in 1937 that what had attracted him to the latter 'was more his (Bose's) magical instinct than the probing of his reason which startled out secrets of nature before sudden flashes of imagination. In this I felt our mutual affinity but at the same time our difference ... my own world of visions had their value not in their absolute probability, but in their *significance of delightfulness*.' And yet, in the next sentence he adds, 'All the same, I believe that a part of my nature is logical which not only makes playthings of facts, but seeks *pleasure in the analytical view of objective reality*.[1] These, then, were the two major components of Tagore's mind vis-a-vis science: 'making playthings of facts' fished out by scientists and deriving 'pleasure' from the 'analytical view of objective reality'.

There are three distinct stages of Tagore's coming to terms with modern science. At the first stage, beginning with his childhood, he is a perceptive, if capricious, student of science—one for whom science and poetry belong to two great but different worlds, mutually exclusive. He was merciless in debunking the Hindu obscurantists who claimed that every scientific fact or theory had its origin in Hindu shastras. It is interesting to note that among other things he was familiar with the famous physics textbooks of Adoiphe Ganot (1804-1887)[2] that had ruled European schools and undergraduate classes for many decades, and on which all Bengali physics textbooks were modelled till 1898. Tagore's acquaintance with Ganot is apparent from a passing reference to Helmholtz and Ganot in the famous satirical poem *Unnatilakshan* ('Signs of Progress', included in his book of poems *Kalpana*) written in 1900. Here he ridiculed the strong variety of the slavish pro-British Hindu revivalism that deified every nauseous superstition in the name of science. Peculiarly enough, for a few years during and after his Swadeshi phase, Tagore himself was taken in by an idealized 'tapovana' vision, which he was to overcome very soon.

As the culmination of this stage, one might consider his delightful essay *Amar Jagat* (My World), written in 1914, shortly after he had returned from a momentous tour of Europe and the USA. That tour was indeed momentous, because it helped, in the words of Krishna Kripalani, to dispel the 'nostalgia for the past which had temporarily overwhelmed him in the early years of the [twentieth] century' and restored his faith in 'the forward march of life, in the free commerce of minds which enrich themselves by giving and taking'[3] *Amar Jagat* is a mock debate between a poet and his scientist friend. The poet apparently accepts the superior position of science so far as knowing objective

facts is concerned. He does not question the validity of such knowledge. One finds the patronising scientist almost patting the poet in the back. Presently the poet hits back, questioning the scientist about his methodology. When describing the apparently fixed stars, astronomy says, they only appear fixed, because you are looking at them from such a great distance. If you could look at them from a sufficiently close distance, or devise some mathematical substitute for such close observation, you will find that they are actually moving fast. Very fine; then how about the earth? The surface beneath your feet is obviously flat, then why do you say that the earth is actually round? Here your point is that if you looked at the earth from a distance, you would get a real picture of its true shape. Why these double standards? Why do you discount your immediate sense data in one case and accept them in the other?

Heaping instance upon instance, drawn from the fields of physics, botany and psychology, the poet himself arrives at the synthesis that both these viewpoints are necessary : he calls them the *near side* and the *far side* of the same thing. One may characterise these as the reductionist and the holistic approach respectively. In his typical Upanishad-honed fashion, he calls them the finite and the infinite. A complete mind, he asserts, has place for both. Indeed, only that mind is complete which can simultaneously comprehend both: the invisible ever-restless sub-atomic particles and an apparently solid nugget of iron, or the extensively porous leaf when looked under a microscope and the tightly shaped one seen by the naked eye. He generalises that concepts such as time, space, position, distance, nearness, movement, stillness, inside, outside—all have this dichotomy. He joyously and triumphantly quotes the famous lines from *Isha Upanishad* to drive his point home : *Tadejati tannaijati taddure tadvantike* (It moves, it moves not; it is far, it is near.)

From here, it is only a step to conclude that the poet need not feel shy when his feelings are apparently at variance with the ideas of the scientist. Poetry has a world of its own which is simply out of bounds for reductionist science. The point to note is that he is not against reductionist science, as long as it remains confined to the domain of science. Reductionist science, he seems to say, has no business to meddle in the affairs of poetry. Thus, in the end the patronising scientist gets a much-deserved rebuff from his poet friend.

From this time onwards, one finds in him a progressively finer appreciation of the philosophical problems of science, as well as its relationship with the other creative areas of humans. At the culmination of this stage, he makes a surprising statement in 1932 :

> *If you ask me what pure modernism is, I would say it's looking at the world not with a subjective personal attachment, but with an objective clinical detachment. That is what constitutes a pure vision; that detached vision is bliss. Modern science analyses reality with a detached mind; modern poetry should also do the same, for that is what is eternally modern.*[4]

It is 'surprising', because earlier he had accused modern (i.e. reductionist) science of intruding upon literature and thereby robbing it of its essential charm, which resided in purely non-rational personal attachment. Literature, he said, was characterised essentially by the prejudices and caprices of the individual, which was in direct opposition to the impersonal and rational objectivity of science. He cites a beautiful example from his own *Chitrangada*. Arjuna is indulging in voyeurism, when he stealthily

looks at young narcissistic Chitrangada undressing before bathing in a pond, rapt at the exquisiteness of her own form. Arjuna is excited and overwhelmed. This, Rabindranath appears to be saying, can be treated in two ways. One is the strictly Freudian interpretation, which is perfectly in order as science. However, the moment that interpretation interferes with and dominates over artistic presentation, it kills art. Tagore felt that Western literature of the modern period had fallen victim to just such an aggression from reductionist science. The extreme obsession of literature with the purely physical aspects of sex, which he saw as a 'nuisance', was a manifestation of this breakdown.

Therefore, when he jumps from this position to its opposite and says that poetry should also look at the world with an 'objective clinical detachment', for that is what is 'eternally modern', one is a little taken aback. However, he goes further. He says:

> The mathematician no doubt engrosses himself in the profound symmetry permeating high-level mathematics, in the unity of forms. The fact of its orderliness is not only epistemic, it belongs also to the sphere of deep feeling: there you get pure bliss. It finds expression at the apex of knowledge where it is free of any utilitarian concern. There knowledge attains liberty. One naturally wonders why this has not been the subject of poetry. The reason, of course, is that its experience is esoteric, its access denied to the common person.

Thus, the poet confidently says, there is no intrinsic impediment to high-level mathematics being the subject of poetry! What a change from the position that science was poking its ugly nose in the delicate affairs of poetry!

TAGORE AND HEISENBERG

This is perhaps the place to recount the tete-a-tete between Tagore and Werner Heisenberg (1901-1971), the physicist of'Uncertainty Principle' fame.

The basic idea of Heisenberg's 'Uncertainty Principle' (also known as 'Indeterminacy Principle') is: 'it is impossible to determine with accuracy both the position and the momentum (e.g., an electron) simultaneously. The more accurately the position is known, the less accurately can the momentum be determined. It appears to undermine the "common sense" view of cause and effect, at least on the atomic scale. How can two consecutive observations of the same particle be distinguished from two observations of different particles, if a particle cannot be located exactly? If a particle cannot be identified without uncertainty, how can one be sure what will happen to it in the future, or if the law of cause and effect is being obeyed?[5] Naturally, the physical significance of this principle gave rise to a sense of insecurity among scientists, including Heisenberg himself.

D M Bose, the well-known Kolkata physicist, informs that Sommerfeld and Heisenberg visited India in 1928, 'both of whom stopped for a few days in Calcutta on their way to attend another International Conference in Japan. Heisenberg appeared one day without any previous introduction in the University College of Science. Some of us ... arranged a lunch at Firpo's for Heisenberg. Rabindranath was in Calcutta at that time. Heisenberg having expressed a desire to see him, it was arranged that we were to take him the same afternoon to Jorasanko (the poet's residence). On arrival, we found that [the poet's son] had arranged a fine tea for us. We left Heisenberg to have a talk with the poet.'

But one gets two diametrically opposite accounts of what transpired between the mature poet (he was sixty-seven at that time) and the young scientist (then only twenty-seven). In his book *Uncommon Wisdom*, Fritjof Capra writes, 'In 1929 (actually 1928) Heisenberg spent some time in India as the guest of the celebrated Indian poet Rabindranath Tagore, with whom he had long conversations about science and Indian philosophy. This introduction to Indian thought brought Heisenberg great comfort, he told me. He began to see that the recognition of relativity, incommensurability, interconnectedness and impermanence as fundamental aspects of physical reality, which had been so difficult for himself and his fellow physicists, was the very basis of Indian spiritual traditions. "After these conversations with Tagore," he said, "some of the ideas that had seemed so crazy suddenly made much more sense. That was a great help for me."'[6]

Already in 1914, Tagore was quoting from *Isha Upanishad (Tadejati tannaijati taddure tadvantike)* to assert that concepts like position, distance, nearness, movement, stillness, inside and outside were not absolute. One can presume that Tagore showed that there indeed was a philosophical strand of thought that went well with Heisenberg's mathematical findings about physical reality, even though it appeared to contradict 'common-sense', i.e., Newtonian, notions.

Well, it cannot be too sure about the impression produced by Tagore on the young Heisenberg, as claimed by Capra. Krishna Datta and Andrew Robinson write: 'However, according to Heisenberg's wife (who was not a scientist), "my husband was not too much impressed by his [RT's] thoughts. The mixture of eastern and western philosophy in his thoughts did not really convince him." (Elisabeth Heisenberg to Authors, 3 Oct. 1990) Since Heisenberg himself wrote nothing on the meeting that has survived, it is hard to know his true impressions.'[7]

Reading between the lines, D M Bose's comment would also tend to support Elisabeth Heisenberg: 'I do not remember what was the substance of his talk, but Heisenberg was very much impressed by the poet's illuminating personality which reminded him of a prophet of the old days.' For, had Heisenberg been scientifically impressed by Tagore's philosophy, is it not reasonable to assume that he would certainly have said something about it to a fellow physicist, namely D M Bose? Instead, what he said had been standard fare for all Westerners: a prophet-like, even Christ-like personality, whatever it might mean.

NON-CONFORMIST READING OF THE UPANISHADS

Be that as it may, it at least shows one thing: that Tagore read and interpreted the Upanishads in his own non-conformist manner. His interpretation and understanding of the Upanishads became increasingly individualistic and progressively tinged with scepticism. For him, the Upanishads were not revealed texts, but had their base in the real temporal life of the people of a bygone age. In 1924, he wrote, '... the words contained in them had their full context in the life of the people of that period, who spoke them. Divested of that vital atmosphere, a large part of the language of these great texts offers to us merely its philological structure and not life's subtle gestures which express through suggestion all that is ineffable'. He was interested more in discovering those 'suggestions' than in theological reasoning : *'the Upanishads are based not upon theological reasoning, but on experience of spiritual life*. And life is not dogmatic; in it opposing forces are reconciled—ideas of non-dualism and dualism, the finite and the Infinite, do not exclude each other.' As for the nature of the subtle 'suggestions'

permeating the Upanishads, he clearly says that 'Suggestion has its unanalysable code which finds its depth of explanation in the living hearts of the people who use it. ... All poetry is full of such words, and therefore poems of one language can never be properly translated into other languages...'[9] He quotes from Keats' 'Ode to the Nightingale' to drive home the point that mere philological correspondence with the English words will not make for a happy Bengali rendering. This analogy with poetry makes it clear that here he is advocating a creative reading of the Upanishads. That is why he was able to express his own idiosyncratic, *non-theological* and sceptical understanding of reality on the one hand, and at the same time communicate with the new ideas of modern science. Heisenberg's experience is a case in point.

One would like to characterise this non-theological and non-dogmatic view of reality as 'cosmic scepticism'.

TAGORE-EINSTEIN DIALOGUE

This cosmic scepticism constituted the core of Tagore's famous dialogue with Einstein on July 14, 1930 at Berlin, although the problems and the dilemmas faced by these two men were different. However, before dwelling on that, a few facts need to be stated. The first is that the published version ('EINSTEIN AND TAGORE PLUMB THE DEPTHS OF REALITY / Scientist and Poet Exchange Thoughts on the Possibility of its Existence without Relation to Humanity' by Dmitri Marianoff, Berlin, *New York Times*, 10 August, 1930) of the celebrated conversation presents some difficulties. To any percipient reader it should be clear that throughout the talk, Tagore is eloquent and expansive, while Einstein is rather halting, often unresponsive, speaking more in staccato phrases than in well-connected sentences. It is noteworthy that during the conversation Dmitri Marianoff, who was to be Einstein's son-in-law, was present and he observed : '... it seemed to an observer as though two planets were engaged in a chat.'[10] Einstein himself said in a letter that 'My conversation with Tagore was rather unsuccessful because of difficulties of communication and should, of course, never have been published.' "However, Sisir Kumar Das records, 'About Einstein's resentment about its publication Andrew Robinson writes in a letter dated 5 January, 1995 (published in *The Statesman*, Delhi, 24 January 1995): "A letter from the *New York Times* to Tagore dated July 12 makes it clear that Einstein sent and approved the text of the conversation before publication. Yet in October 1930 Einstein wrote to Romain Rolland that the July 14 conversation 'should of course, never have been published' as if it had appeared without his consent."[12] The point perhaps is not that the conversation was published without his consent, but that his consent was only half-hearted. Why was Einstein so hesitant and unhappy about publishing the conversation, which contrasts strangely with the eagerness with which Tagore and his friends published it?

Another version of the talk called the 'Authorized Version' was published in the January 1931 issue of *The Modern Review*, Calcutta. The two versions have significant differences. While Tagore's sentences have had the benefit of being refined through revisions, Einstein's have not. Moreover, there are important theoretical shifts on Tagore's side. Overall, the published accounts of the conversation were a bit unfair to Einstein, who, after all, was fearless in expressing his scientific and philosophical views.

On the request of Romain Rolland, Einstein agreed to write a contribution to *The Golden Book of Tagore* in 1931. 'Initially it was decided that he would write on the duties of intellectuals against war. However, Einstein changed the subject absolutely and instead wrote an article titled *About Free Will*. ...This article is tinged with some irony,

which might be a result of Einstein's dissatisfaction with the said conversation.' Einstein's article begins with the observation:

> If the moon, in the act of completing its eternal way round the earth, were gifted with self-consciousness, it would feel thoroughly convinced that it would travel its way of its own accord on the strength of a resolution taken once for all.[13]

Indeed this difference had been the axis around which the 'conversation' had spiraled : human consciousness and natural laws. There one finds Tagore repeatedly emphasising the classical Berkeleyan stand that sense data had no 'real' significance and that reality existed only in the consciousness of what he called 'Universal Man'. Einstein was fully familiar with this syllogism - he was well versed in Berkeley. However, in 1930, when this conversation took place, he had become too much of a 'realist' to accept that.

PHILOSOPHY OF SCIENCE

By the 1920s Einstein had given up his earlier neo-positivist, Machian stand that science could deal only with observed facts and relationships, and not with generalisations, that concluding anything beyond observed ("positive") facts was a concession to and compromise with metaphysics.[14] 'Einstein's 1905 paper on special relativity shows the obvious influence of Mach; ... Einstein acknowledged his debt to Mach; in a letter to him a few years later, he called himself "your devoted student".[15] However, by 1922 Einstein had grown out of Mach's neo-positivism: 'in a Paris lecture in 1922, Einstein referred to Mach as "un bon mecanicien" but a "deplorable philosophe".'[16] Heisenberg recounts that by 1926 Einstein 'thought that every theory in fact contains unobservable quantities. The principle of employing only observable quantities simply cannot be consistently carried out.' This was patently opposed to Mach's philosophy to which Einstein had earlier subscribed. When Heisenberg pointed this out, Einstein 'answered simply, "perhaps I did use such philosophy earlier, and also wrote it, but it is nonsense all the same."'[17]

Thus, when Einstein and Tagore were 'plumbing the truth' and enquiring whether reality could exist 'without relation to humanity', Einstein had clearly moved away from Machian neo-positivism and embraced realism. That means : (1) he was convinced that the universe was real in the sense that it was potentially 'knowable' by applying the scientific method, and (2) theorising beyond strictly observed facts was not incompatible with scientific rigour.

That change of stand also lay at the root of Einstein's discomfort with Quantum Mechanics which depicted a probabilistic as against a deterministic picture of nature. Herein lay Einstein's dilemma. He was too great a mathematician and physicist not to agree with Heisenberg's principle; but philosophically he was an absolute realist, which meant he believed that the senses could deliver a true—not a probabilistic—picture of reality, provided people had the right theories and the right methodology. However, this was only a belief. Even at the end of his life, he could not resolve this conflict. Thus, one finds the curious phenomenon that an idealist poet was arguing in terms of *logic* and a realist scientist was confessing that 'This is my *belief*, although I know well that it is not fully demonstrable.'

What is the essence of that belief? In his article in *The Golden Book of Tagore*, Einstein says : 'Man defends himself from being regarded as an impotent object in the course of the universe. But should the lawfulness of happenings, such as unveils itself more or less clearly in inorganic nature, cease to function in front of the activities in our brain?' He points outs that 'alcohol and other sharply controllable factors' do have an influence 'on our thoughts, feelings, and activities.' Therefore, 'determinism does not stop before the mystery of human will.'[18]

This was an obvious retort to Tagore's stand that 'the infinite personality of man comprehends the universe. There cannot be anything that cannot be subsumed by the human personality, and this proves that the truth of the universe is human truth.' Einstein talks about 'two different conceptions about the nature of the universe—the world as a unity dependent on humanity, and the world as reality independent of the human factor.' To this, Tagore's riposte is the classical relativist stand that 'the world apart from us does not exist; it is a relative world, depending for its reality upon our consciousness.' Maybe twenty years earlier Einstein might have found much in this to agree with, but not now, when he had become a hardcore 'realist'.

Einstein is ready to concede that concepts like 'beauty' are human-specific, but scientific 'truth' is not. Tagore explains beauty as 'the ideal of perfect harmony, which is the universal being.' One becomes increasingly aware of Tagore's unconcern for scientific methodology, about what constitutes 'scientific truth'. He does not seem to appreciate that as a working scientist Einstein's primary duty was to be true to his method. The scientist cannot follow the dictates of his mind, unless these were commensurate with his mathematics and his method. That is why he could not deny the worth of quantum mechanics, even as he was strongly opposed to it philosophically. Not so with Tagore. He was not answerable to scientific rigour. He was free to follow the dictates of his creative soul. Thus, he could easily say : 'Truth must be essentially human.' This is very definitely wrong as far the logic and the method of science is concerned. The utmost concern of science is to make its findings independent of the human factor. That it often fails to achieve this level of objectivity is of course another matter.

Tagore, however, does not dismiss the difference between scientific truth and what he hypothetically calls the 'universal truth'. On the contrary, he agrees that there are two kinds of truth : one scientific, the other universal. He acknowledges that scientific truth 'can only be reached through the process of logic,' but that very logic is only 'human'; hence scientific truth is dependent on human beings. Scientific truth is merely a human truth, nothing beyond that. The obvious corollary is that science, human-dependent as it is, cannot lead us to an objective understanding of reality. No wonder he ends up denying the comprehensibility of the universe by invoking Maya: 'what appears to be true to the human mind, and therefore is human, may be called Maya, or illusion.'[19]

This may be very subtle philosophy, but for a working scientist, this must be stupefying. In Einstein's own words in a different context, 'Why should anybody go to the trouble of gazing at the stars if he did not believe that the stars were really there?' One can almost see why Einstein thought that this conversation should not have been published. For the two were talking at cross-purposes: one was talking about how to account for the real universe of which man was only a part; the other was talking about

'merging the individual in its infinity'. The 'two planets' were indeed chatting from their individual orbits!

One more point about Tagore's *maya* logic. Although steeped in the Upanishads, Tagore, like his father, was by no means a *mayavadin*. So much of his poetry and other works are critical of those who see this world as an illusion. Why then this departure from his professed stand? One feels that here, in this specific instance, he was carried away by his own philosophical logic. That was his own dilemma: how to reconcile the 'scientific truth' with the so-called 'universal truth'? He was fully aware of the value of 'scientific truth', but at the same time, he was wedded to the concept of a 'universal truth'. *Maya* provided him with an easy and expedient route out of this impasse.

Einstein's dilemma was different: how to reconcile the mathematically irrefutable conclusions of probabilistic quantum mechanics with his realistic and deterministic conviction? He is unable to resolve this contradiction, but unlike the poet, does not seek an illusory or expedient resolution. He simply accepts the contradiction and the agony. Thus, while contributing to *The Golden Book of Tagore* a few months later, Einstein simply expressed his 'conviction' without taking recourse to the principle of demonstrability:

> This is my conviction, *although I know well that it is not fully demonstrable*. If one thinks out to the very last consequence what one exactly knows and understands, there would hardly be any human being who would be impervious to this view, *provided his self-love did not ruffle up against it*.[20] (Italics added)

The last few words probably account for what Dipankar Chattopadhyay characterises as 'ironical'. That also explains the concluding words of Einstein in the July interview : 'Then I am *more religious* than you are!' What he means is, as a realist scientist, he is a 'believer' in the 'knowability' of the universe, so he does not have to subscribe to cosmic scepticism, whereas Tagore, believing in an inscrutable 'Brahman', is a victim of that.

Thus, it may be concluded that while Tagore might or might not have had the so-called 'correct' or the 'scientific' view of reality based on hard facts and proven theories, his was an open-ended mind, capable of accommodating and dealing with emergent notions. This is perhaps more than what many of his great idealist Indian contemporaries could accomplish.

Notes :

1 Sisir Kumar Das (ed.), 'Jagadis Chandra Bose,' in *The English Writings of Rabindranath Tagore*, Vol. Ill (New Delhi: Sahitya Akademi, 1996), p. 826.
2 I am grateful to Professor Subir Kumar Sen for pointing out the Ganot-connection.
3 Krishna Kripalani, *Tagore : A Life*, NBT, New Delhi, 2001 reprint.
4 *Rabindra Rachanavali*, W B Govt edition, Calcutta, 1961, Vol. 14, p. 348.
5 E B Uvarov and Alan Isaacs, *The Penguin Dictionary of Science*, London: Penguin Books, 1993, p. 464.
6 Quoted in Dipankar Chattopadhyay, *Rabindranath O Vigyan*, Ananda, Kolkata, 2000, p. 252.
7 Krishna Datta and Andrew Robinson, *Rabindranath Tagore : The Myriad-minded Man*, Rupa, Calcutta, 2000 ed., p. 443
8 Dipankar, Chattopadhyay, op. cit.
9 See S Radhakrishnan, *The Principal Upanishads*, Appendix A, pp. 939-940
10 Dipankar Chattopadhyay, op. cit., p. 243.
11 Ibid. p. 245.
12 Sisir Kumar Das (ed.), op. cit., p. 1010.

13 Albert Einstein, 'About Free Will,' *The Golden Book of Tagore* (1931), 1990 reprint, p. 12.
14 The anti-Machian import of Einstein's conversation with Tagore has been well noted by D P Gribanov, 'Einstein's Philosophical Worldview,' in *Einstein and the Philosophical Problems of 20th-century Physics* (Moscow: Progress Publishers, 1979, 1983), pp. 12 and 25.
15 Steven Weinberg, *Dreams of a Final Theory*, Vintage, London, 1993, p. 139.
16 Ibid. p. 143.
17 Ibid.
18 *The Golden Book of Tagore*, p. 12.
19 Some philosophers have raised the question whether Tagore was right in translating the Sanskrit word *maya* as 'illusion'. According to them, *maya* is also a cosmic principle that seeks to explain the existence and creation of the world. I am not competent to judge the point. However, translating the Sanskrit word as 'the veil of illusion', a standard dictionary defines *maya* in much the same sense as Tagore's: 'The way in which the world is experienced and which disguises the unity of reality.' (Simon Blackburn, *The Oxford Dictionary of Philosophy*, Oxford: Oxford University Press, 1996, p.235).
20 Albert Einstein, op. cit.