

“Science and Society in Postcolonial India”: Responses of Rabindranath Tagore, A. J. C. Bose and P. C. Mahalanobis”

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Rabindranath Tagore, A.J.C. Bose and P.C. Mahalanobish form an interesting trio of thinkers from three diverse disciplines brought together in their willingness to debate the positionality of science in postcolonial India. All of them were institution builders and they applied their ideas on the subject in their respective educational ideologies. The three thinkers probed certain overlapping ideas- the ceaseless dialectic between cosmopolitanism and nationalism, a keen blending of the spiritual and the modern, the swiftness of the protest against dogma and colonization and a keen sensitivity and appreciation of the literary. In their respective ways, they were equally institution builders putting their respective ideas into practice, offering alternatives and synthesizing modernity and tradition within a straitjacketed education system. My paper will seek to keep these issues in context and explore a key dimension to the overlap of their ideas- an acute anxiety about the praxis of modern science and the modus operandi of its applicability in postcolonial India. In their respective ways, each recognized science as a way of revitalizing a moribund Indian society and were keenly aware of the enormous pitfalls that a blind submission to a cult of science could entail especially in the context of the world war. All three visionary thinkers were not only constructing their own possible utopias within the face of hostile historical realities, but also putting them into praxis.

This leads us to Tagore's rather problematic interaction with modern science. Of all the modern thinkers it was Tagore who realized the potential of technology to ease the problems of the broader world population and he advocated its use:

If the cultivation of science by Europe has any moral significance, it is in the rescue of man from the outrage by Nature, not in its use of man as a machine but in its use of the machine to harness the forces of Nature in man's service.

("Cult of the Charkha", Das III: 542)

Tagore's syncretic and international mind also revolted against India, insulating itself from the progression of modern science: "No longer will it be possible to hide ourselves away from commerce with the outside world. Moreover such isolation itself would be the greatest of deprivations for us" ("Call of Truth", in Das III: 422). At Sriniketan, for example, Tagore decided to import machines to facilitate agriculture, having sent his own son to America to study technological advancements in the agricultural sector. However, Tagore was also quick to realize the human greed and exploitation that machines generated and linked it to the spirit of nationalism and imperialism. The First World War fresh in memory, many of Tagore's texts reveal his profound dilemma about the use of science and technology. Tagore's play *The Waterfall* is a dramatic enactment of this dilemma. It was later in essays like *Crisis in Civilization* that we recognise Rabindranath's disillusionment with modern science as inevitably leading to exploitation, human greed and avarice. In *The Waterfall* there is still a substantial admiration for the machine. Time and again, Tagore reminds that it is human pride and the misuse that lead to the sufferings caused to man. There is an acknowledgement of the power of the machine as an agent of transformation in these lines:

We salute the machine, the machine,

Loud with its rumbling of wheels,

Quick with its thunder flame,

Hurling against obstruction

Its fiery defiance

That melts iron, crushes rocks,

And drives the inert from its rest.

We salute the Machine, the Machine. (Waterfall, Das II: 169)

The choice of Bhairav as the presiding deity in the play is interesting. Bhairav represents within his body the eternal peace of Shiva, his spirit of renunciation and simultaneously reminds us of the destructive powers. The song of the machine reminds us that it has similar powers of destruction akin to Shiva. However, the tale of exploitation that it generates is in direct opposition to divinity.

Tagore's engagement with the machine and the practices it generated was deep and philosophical. This can be observed in a letter to Kalidas Nag that outlined the play's treatment of this issue. Tagore wrote:

The machine is an important part of the play. This machine has injured the spirit of life and it is with this spirit that Abhijit has destroyed the machine, not with another machine. Those who exploit with the help of the machine make a drastic mistake- they kill the very humanity that is within them also- their own machine destroys their inner human self. Abhijit represents these men, the afflicted among the powerful, who destroy the machine to free themselves from the machine with which they destroy. Dhananjoy, on the other hand, represents the humanity which is being oppressed by the machine and his message clearly is that, "I will triumph because I will not allow the machine and its injuries to overcome my inner spirit". The tragedy is really of the man who uses the machine to injure: it is he who has to look for freedom from his own machine and destroy it if necessary.

(Rabindra Rachanavali 7: 743, translations mine)

Clearly Tagore's understanding of the tragedy of the man and the machine was part of a broader understanding of Modern Europe struggling to negotiate with the spirit of destruction that it had unleashed. In a brief essay written in 1932, titled "Can Science Be Humanized", Tagore expanded on this idea. He begins by arguing that, "There is no meaning in such words as spiritualizing the machine; we can spiritualise our own being which makes use of the machine, just as there is nothing good or bad about our bodily organs, but the moral qualities that are in our mind" (Das III: 666). He warned that the forces of science had to be understood in all its complexity:

It is some great ideal which creates great societies of man; it is some blind passion which breaks them to pieces. They thrive so long as they produce food for life; they perish when they burn up life in insatiate self-gratification. We have been taught by our sages that it is truth and not things which saves man from annihilation. (Das III: 666)

Rabindranath articulated the same idea in his play *Raktakarabi* (The Red Oleanders) where the residents of Yakshapuri are no longer identified by their personalities but reduced to empirical numbers in a world that unites science and greed under the umbrella of ruthless oppression. "The Author's Interpretation" clearly indicated the colonial context of the play where the benefits of science are denied to inculcate a culture of oppression where the power of organization is ruthless. Tagore writes:

I am not competent to say how Europe feels about this phenomenon produced by her science ... but I can say, on behalf of inarticulate Asia, what a terrible reality for us is the West, whose relation to ourselves is so little human. The view that we can get of her, in our mutual dealings is that of a titanic power with an endless curiosity to analyse and know, but without sympathy to understand; with numberless arms to coerce and acquire, but no serenity of soul to realize and enjoy ... now we have an organized avarice- frightfully simple in its purpose, mechanically complicated in its process.

("The Author's Interpretation", *Raktakarabi* 121-22)

Science seems to generate a hostile presence in this play for Tagore:

I am told that science has become a principal subject for some notable poets in Europe. That is natural for science has permeated Western life; it no longer has its own cradle in the secluded cells of the learned. In a similar manner the hungry purpose, having science for its steed, running about unchecked, trampling our life's harvest is not an intellectual generalization unfit for imaginative literature. It is intensely real; its hot breath is upon us; its touch is all over our shrinking soul. It is the principal hero today in the drama of human history. ("The Author's Interpretation", *Raktakarabi* 122)

Against this monolithic behemoth, Tagore pits Nandini ("the joy in life") and Ranjan ("the joy in work") as they embody the spirit of the play:

I have stronger faith in the simple personality of man than in the prolific brood of machinery that wants to crowd it out ... the joy of this faith has inspired me to pour all my heart into painting against the background of black shadows- the nightmare of a devil's temptation- the portrait of Nandini as the bearer of the message of reality, the savior through death. ("The Author's Interpretation", *Raktakarabi* 123)

The climax of this play lies not in the fate of Nandini or Ranjan but in the transformation of the King who turns against his own sceptre of power and rediscovers his own personality. The freedom from the dungeon of power in which he is himself enslaved throughout the play draws attention to the dehumanizing power of science allied with nationalism and greed.

As early as 1895, J.C. Bose demonstrated to a mesmerised Calcutta audience, the possibility of wireless transmission of radio waves over a distance of 75 feet. Bose presented his first results before the Asiatic Society, Calcutta, in May 1895. According to the pioneering Indian chemist, Acharya Prafulla Chandra Ray, who was a colleague and close friend of Bose at Presidency College, "It appears that he had not then realised the importance of the new line of research he had hit upon" (Sengupta, "Anamaniyo Jagadish Chandra", Anustup 94, translations mine). Bose sent copies of his research paper to his former teacher Lord Rayleigh and to Lord Kelvin and both realized its worth. Bose went on a lecturing tour of England and Europe during 1896-1897 and then again during 1900-1902, when he visited America. After his public lecture in 1897 at the Royal Institution in London, the British press expressed "surprise that no secret was at any time made as to its (the invention's) construction, so that it has been open to all the world to adopt it for practical and possibly money-making purposes" (Sengupta, "Anamaniyo Jagadish Chandra", Anustup 93, translations mine). An early admirer of the Bose coherer was the British navy, which used it to establish effective radio link between a torpedo boat and friendly ships. In May 1901 Bose informed Rabindranath Tagore:

the proprietor of a reputed telegraph company ... came himself with a Patent form in hand ... He proposed to take half of the profit and finance the business in the bargain. This multi-millionaire came to me a begging. My friend, I wish you could see that terrible attachment for gain in this country, that all engaging lucre, that lust for money and more money. Once caught in that trap there would have been no way out for me. ("J.C. Bose to Tagore", Anustup 576)

Exasperated by Bose's rather diffident approach towards money, Margaret Noble (better known as Sister Nivedita) and American-born Mrs. Sara Bull on their own initiative obtained in 1904 an American patent in Bose's name (for his "galena single contact-point receiver"). Bose, however, remained unmoved and refused to encash the patent. The irony of the situation seems to have gone unnoticed. Here in Nivedita

we have a spiritualist, advocating the cause of patents and royalties; and a physics professor dismissing the idea! There can be no doubt, as P.C. Ray reminded the audience, assembled in 1916 to greet Bose on his knighthood, that, "If he had taken out patents for the apparatus and instruments which he had invented, he could have made millions by their sale" (Sengupta, "Anamaniyo Jagadish Chandra", Anustup 94, translations mine). More importantly, he would perhaps have become an Indian role-model for production of wealth through science. Was it keeping in view the possibilities of such misuse that Bose abandoned radio waves altogether?

D. M. Bose recalls that when J. C. Bose was asked as to who was the inventor of the radio, his answer used to be, "The invention is more important than the inventor" ("J.C. Bose", D. M. Bose Centenary Volume 12). He was so consistent about his faith of distributing the fruits of one's labour, without thinking of one's personal benefits, that he made it one of the rules of the constitution of the Bose Institute that, "no invention from this Institution should be patented". Bose's anti-patent position is explained in his authorised 1920 biography written by his close friend Patrick Geddes: "Simply stated, it is the position of the old rishis of India, of whom he is increasingly recognised by his countrymen as a renewed type, and whose best teaching was ever open to all willing to accept it". (Geddes 67)

Like Tagore, who wanted Visva-Bharati as a space where the best of the East and the West could meet without the shadows of avarice, Bose considered science as a democratic space, accessible to all, in the cause of welfare. In his inaugural address, dedicating the Bose Institute to the nation, delivered on 30 September 1917, he began his speech by arguing:

I dedicate today this Institute- not merely a laboratory, but a temple ... out of the very imperfection of his senses, man has built a raft of thought by which he makes daring adventures on the great seas of the unknown ... the personal, yet general, truth and faith whose establishment this Institute commemorates is this: that when one dedicates himself for wholly a greater object, the closed doors shall open, and the seemingly impossible will become possible for him. ("Bose Institute", *Wikipedia*)

Tagore echoed the same sentiments at the Basu Vigyanan Mandir:

I offer my salutations to the illustrious founder of this Institute, humbly sitting by those who are deprived of the sufficiency of that knowledge which can only

save them from the desolating menace of scientific devilry and the continual drainage of the resources of life, and I appeal to this Institute to bring our call to Science herself to rescue the world from the clutches of marauders who betray her noble mission into an unmitigated savagery. (Sengupta, "Anamaniyo Jagadish Chandra", Anustup 94, translations mine)

It is striking to note here that both Tagore and Bose were identifying similar pitfalls in an uncritical acceptance of science. Science as a handmaiden of greed divorced from the broader populace was seen as a potential monster by both; it could be a beneficial agent only and only if it could be accessed by every section of society.

One of the early attempts of the young Mahalanobis along with Sukumar Roy was to rebel against the rigidities and ossification of the Brahma Samaj and its adamant stance against Rabindranath. The argument was simple: the interaction of religions mutually enriches both religions, as does the interaction of cultures. In 1917 both asserted that their goal was to "engage in thought about the holistic improvement of life and the search for human ideals through practice" (Mahalanobis, "Keno Rabindranathke Chai", Dasgupta 28, translations mine) it is in this context that they demanded that Rabindranath be made the Honorary member of the Brahma Samaj. On 19 March 1921 the proposal was carried by a vote of 446-233. In an essay Mahalanobis argued:

We have seen that Rabindranath has circulated the idea of a universalism that is based on all mankind. This universalism has not crushed individuality, has not denied the national, has not stifled diversity. It has always stressed unity within diversity. It is this spirit that Rabindranath has considered the worship of India's hidden self. (Mahalanobis, "Keno Rabindranathke Chai", Dasgupta 37, translations mine)

Interestingly Mahalanobis relates Tagore's cosmopolitanism to Rammohun in his essay "Rabindranath Thakur o Viswamanatabodh." Arguing that Rabindranath's "world consciousness" is not a mere theory, he adds that this is a synthesis of all possible human ideals and the deep bond that exists within cultures and this is the truth of history. Identifying that this involves an acceptance of Western science as an antidote to superstition and dogma, he is ready to accept science as a source that liberates the democratic rational spirit in man that is not subject to the tyranny of few. The point where science succeeds is where it can provide an entry to the deeper truth of man

where similarity and unity is achieved. It is thus significant that the motto of the Indian Statistical Institute, that Mahalanobis instituted, is "Unity in Diversity".

I would like to underscore Mahalanobis's ideas on statistics and its functionality in the nationalist context. As Mahalanobis suggested:

Statistics must have a clearly defined purpose, one aspect of which is scientific advance and the other, human welfare and national development. The value of science to society lies in its unorthodoxy and ability to challenge accepted concepts and theories. (Mahalanobis, "Statistics Must have a Purpose", Sankhya 336)

Consequently, when we look at his experiments and his work we locate a movement from the abstract to the concrete. Thus his experiments include the study of tea drinking habits, public opinion, crop acreage and plant disease and sample surveys on rural indebtedness, the food shortage in Bihar, rural industries, apart from suggesting major industrialization of India during the second five year plan. Mahalanobis's dedication to the cause of the Second Five Year Plan outlines the commitment of the scientist to the social cause:

It is our responsibility, as scientists, to work out the logic and techniques of planning suited to India. It is our responsibility, as scientists, to educate and convince our countrymen that India is a great country with vast resources, natural and human. We have the responsibility to use these resources to improve the level of living of our countrymen and to promote science and culture. We should welcome foreign help and cooperation, especially, in science and technology and in cultural matters. Also, we must realize that it is not necessary continually to depend upon help from abroad. We must overcome the defeatist attitude which would make us continually ask for foreign loans. We must realize that political independence is not enough; we must win economic independence. We have the ability and the responsibility to make rapid economic advance with our own resources, and with hard labour, scientific thinking, wise decisions, and seriousness of purpose. We must have faith in ourselves. (Mahalanobis, "Science and National Planning", Sankhya 82)

Justifying the thrust towards industrialization in order not merely to generate productivity but to generate employment, Mahalanobis wrote:

The task of planning must be to improve continually the level of living, especially,

of the 95 percent of the population who are poor, and to create enough new employments to get rid of the fear of unemployment. It has been recognized for a long time that this can be done only through rapid industrial development. As India has plenty of iron ore, coal, bauxite, etc., the key to industrialization lies in establishing the manufacture of heavy machinery, heavy electrical equipment (turbines, generators, switch and transmission gear), and machine tools. Once this is done, everything else can be gradually manufactured in India mostly out of domestic resources. As more and more machinery becomes available, it would be possible to create more and more employment and continually to construct more machinery and expand the production of coal and electricity; steel and aluminum; fertilizers, cement and heavy chemicals; equipment for transport and communications; scientific instruments, etc.; and, in this way, produce more and more consumer goods and improve the level of living. ("Science and National Planning", Sankhya 82)

However as analysts have pointed out the rationale for the second five year plan was an emphasis on industrialization; especially in heavy industries with the rationale that in an industrially backward community with low productivity, the agriculture sector could not provide more employment and that heavy industries would lead to trickle down effects. However with its emphasis on capital goods, this measure had limitations especially with a scarcity of essential commodities and the fall in food output due to bad harvests. Do we locate here a recurrence of the issues raised in Rabindranath's *The Waterfall*? Did the championing of mechanization ignore the more important issues of survival in the ground situation? Quite obviously the debates between Rabindranath and Mahalanobis's visions were marked here.

Rabindranath wrote about J C Bose: "But to my relief, I found in him a dreamer, and it seemed to me, what surely was a half-truth, that it was more his magical instinct than the probing of his reason which startled out secrets of nature before sudden flashes of his imagination" (Tagore, "Jagadish Chandra Bose", Das II: 826). It was this quality of the utopian visionary that all three shared and their confluence was the ways in which they tried through their writings and their activities to create utopias of human possibility and put them into praxis.

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