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ROLE OF SCIENTISTS IN COLONIAL BENGAL*

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The paper seeks to examine the role of the scientists in Bengal during the British rule. It has focused directly on the scientists and their efforts to bring to light their ideas and endeavours meant to oppose the colonial rule and its exploitation, and achieve freedom for the country. The scientists did endeavour for freedom in tune with the on-going political movements against the British rule; and acted on their own, too. In that process, they made special contributions towards infusing rationalism and secularism to the freedom movement, keeping in view the perspective of in India's plural society and internationalisation of the question of her freedom and development. They contributed most during the *Swadeshi* movement, at the National Planning Committee (NPC) and during the years of the Second World War and post-war reconstruction.

Key words: Bengal, Colonial rule, Freedom movement, Nationalism, Scientist, Second World War, *Swadeshi*

INTRODUCTION

The contribution of Bengal to India's freedom struggle is much known to students of Indian history. In that, political leaders, writers and social reformers have been in the limelight; the role of the peasants has also

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received attention in the past decades; and, of late, women are queuing up for their share. But justice is yet to be done with the scientists of Bengal, as of any other part of the country, in this regard. It is not that they have not been talked about in the narrative of the freedom struggle; they have been, but their role has been appended to others and their real contribution to it has been only marginally appreciated. From this point of view, the works of A.K. Biswas, Chittabrata Palit and J. Lourdusamy are welcome endeavours. This paper is an effort to further fill in this gap. It seeks to study the role of scientists in Bengal with reference both to their direct involvement in politics and their stance and initiative against colonialism through their profession. But why until now has their contribution gone generally unnoticed, needs some explanation. Apart from the political leaders having stolen the lime light, this has essentially been so because of the lack of proper understanding of science, especially its real relations with the society.

This has been true also about the rest of the country and even the advanced countries of the world, but more so about the underdeveloped and developing societies everywhere (Sinha, 2008). Since most scientists in India were under the colonial employment under compulsion, working as surveyors, university teachers, chemists, engineers and the like, they could not speak against their masters openly; those who were not in any job were in such a precarious condition socially and economically that they could not take any independent stand on any issue.

Yet there were many who stood against the Raj, and colonialism and imperialism. As early as 1880s, noted chemist P.C. Ray openly criticised the British rule in India in an essay on 'India before and after the Mutiny' when he was still a student at the University of Edinburgh in England and his illustrious disciple and famous astrophysicist M.N. Saha carried the struggle against the Raj until India became free. There are many others, like P.N. Bose, Ashutosh Mukherjee, Brajendranath Seal, J.C. Bose, who fall between them, and there are still others who are yet waiting to find their place in history.

Swadeshism against the Colonial Rule

Bengali scientists' concern for the decaying life under the colonial rule and using science to stop the process may be traced to the emergence

of the idea of swadeshism (self-help with indigenous resources) in the last quarter of the 19th century (Sarkar, 1973). M.L. Sircar (1833-1904), a doctor, took up the matter seriously and founded the Indian Association for the Cultivation of Science in 1976.[1] The association aimed at promoting science for national regeneration and progress with self-help (Sarkar, 1896). Establishment of the Dawn Society (1902) was another landmark endeavour in this direction.[2] Spirit of swadeshism was already manifesting in economic nationalism. These developments, together with the influences of the ongoing socio-religious reform movement of the time inspired and encouraged the intellectuals of Bengal to do their bit. And very soon a band of them started mining their indigenous resources to project the capabilities of their country against the justification for colonial rule: P.C. Ray (1861-1944) (Ray, 1958), and P.N. Bose (1855-1934) (Bose, 1896) wrote and elaborated upon the Indian achievements in the field of sciences in the past. Ramendrasundar Trivedi (1864-1919) (Sarkar, 1993) and Brajendranath Seal (1864-1938) (Seal, 1915) presented discourse on science and the Indian philosophy. And J.C. Bose tried to validate the ancient Indian understanding of life and matter with the help of modern science (Mukharjee, 1902). All this was done to project India's contribution to the progress of human civilisation in the past in order to counter the European's negative portrayal of India's past.

But a more overt, strong and wide initiative was undertaken during the *Swadeshi* Movement. The *Swadeshi* was the first major assault against the British rule after the Revolt of 1957. In opposition to the British policy and, in fact, its rule itself, the people rose against the existing administrative system and the economic order created by it, and tried to build up an alternative arrangement (Sarkar, 1973). Of many things undertaken during the *Swadeshi*, the most important from our point of view were those in the fields of education and industrial production. Establishment of the National Council of Education and the Bengal Technical School in 1906 in Calcutta were landmark events (Mukherjee, 1953). Already, a scholarship had been created in Bengal by the Association for the Advancement of Scientific and Industrial Education of Indians (f. 1904) for sending students for technical training abroad. It is noteworthy that of the 236 scholarships granted by the society during the 4 years of its life through 1904-08, very few were granted for studies in the UK, whereas the overwhelming numbers were allocated

for the USA and Japan (Haridas and Uma, 1957). This shows how the society was helping Indians come out of the shadow of the British Empire. On their return from training abroad, these scholarship-holders set up a number of industries in Bengal with the help of scientists like P.C. Ray, such as Calcutta Pottery Work, Calcutta Chemicals and Bengal Waterproof Company. The Association also set up a Small Industries Development Company and an agricultural estate at Deoghar.[3] As a matter of fact, a whole system of National Education Movement was inaugurated: new educational institutions were started, with new courses focused on the indigenous needs, and under indigenous management (Mukherjee, Haridas and Uma 1953, 1957). Likewise, several industries were started with local help, including the scientists and intellectuals. The Bengal Chemical started by the noted scientist P.C. Ray was the best example (Sarkar, 1973).

But, the *Swadeshi* movement was somewhat divided on the ideological level: some of the participants wanted to go with everything traditional; the others were not averse to adapting to modern ways and also making use of modern science and technology. The scientists cleared this confusion significantly as P.C. Ray and his likes supported industrialisation on modern lines. However, in all cases, both the groups worked with indigenous resources and under indigenous management, and their prime goal was self-help and self-sufficiency in initiating a national reconstruction, implicitly to fight the British Raj (Sarkar, 1973). The experiments and initiatives of Rabindranath Tagore in rural reconstruction and education at Santiniketan were not far from this ambit (Krishna, 1971).

During this period and thereafter, the Bengali scientists and intellectuals kept on writing on various aspects of life in the background of the colonial rule and India's traditional heritage. Of them, J.C. Bose drew his inspiration from India's philosophical tradition to prove the element of unity in nature. In muffle tones, he used his findings to show the intrinsic equality in nature—against the then existing inequality created by man. Not unambiguously, he was hinting at the inequality created between the rulers and the ruled (in this case, the British and the Indians) (Gupta, 1964, Bose, 1971). There were many others who spoke or wrote in journals like the *Modern Review* and *Calcutta Review* in the same manner and tone. The *Swadeshi,* however, dwindled gradually in the years to come.

Beginning of Organised Initiative

But this was not the end of the indigenous initiative. The nationalist politics had already taken a radical turn from the Surat Congress. The Moderate politics was giving way to revolutionary nationalism, and an element of radicalism and aggression was very much in the air. At this juncture, while scientists like P.C. Ray founded educational institutions and established industries with private resources and under indigenous control, a few others preferred not act against the Raj openly or even worked under it, yet they tried to do what they wanted. For example, Ashutosh Mukherjee (1864-1924), a brilliant mathematician and a great intellectual, did not mind acting as the Vice-Chancellor of Calcutta University; but he skilfully utilised this position to realise his nationalist aspirations. He introduced subjects of local interest and picked up indigenous talent who soon proved their mettle as scholars of substance. P.C. Ray and C.V. Raman were some of them. Mukherjee was instrumental in the foundation of several organizations, including the Bengal Technical Institute (1906), the Calcutta University College of Science (1914) and the Calcutta Mathematical Society (1908). He was the first president of the session of the Indian Science Congress in 1914.[4]

Ashutosh Mukherjee[5], was helped in his endeavour by his contemporary, Brajendra Nath Seal[6], a rationalist, humanist and philosopher, who headed several academic institutions and held prestigious academic chairs. He was knighted in 1926. Yet, he worked to project India's philosophical tradition before the world, and in his *Comparative Studies in Vaishnavism and Christanity* (1912), expressed an urge to break free from the hegemony of methods applied in Eurocentric academic enquiry. Attracted to the spirit of swadeshism, he helped Rabindranath Tagore in founding the Viswabharati in 1921and later became its first Chancellor. Girish Chandra Bose (1853-1939) was another scientist who did not take part in the freedom movement actively, but in no way lacked in the nationalist spirit. Trained in agriculture in London and fellow of several scholarly bodies, including the Royal Agricultural Society (1882), and the Chemical Society of England (1883), he realised on return home that India's economic self-sufficiency was possible only through the development of agriculture. Therefore, he devoted himself to its development. For this, he started a weekly magazine

Krishi Gazette (1885), established Bangabasi School of agriculture (1886), and wrote several books on agriculture and the allied subjects.[7]

These are just a few representative examples of individual initiative. Under colonialism, any effort to exert the indigenous talent or to promote and apply it to local progress was a challenge to the superiority of the masters. However, there were a host of others who participated in the freedom movement very actively, including Bidhan Chandra Roy (1882-1962),[8] to some of them we may return at a later stage.

The outbreak of the First World War created a temporary impasse; but the colonial policy during the war and soon after was consequential: While the Reform Act of 1919 aimed at pacifying the political opinion momentarily, the Rawlat Act and the Jalianwala Bagh episodes stirred the whole nation. Meanwhile, the Government of India went back on its promises of industrialisation of the country (Sinha, 2008, Vishwanathan, 1985). These developments had profound impact on the freedom movement and intellectual initiatives throughout the country, including in Bengal.

The lesson the scientists drew from them was the necessity of professional unity and organisation. This led to the organisation of professional groups and establishment of scientific institutions on a phenomenal scale up to the Second World War. The Science Congress Association had been founded in 1914; this was followed by the formation of professional associations in various subjects. Scientific journals and those dealing with general concerns that touched upon the different areas of science had already started appearing in Bengal, such as the *Dawn*, *Modern Review, Calcutta Review*; after the First World War, they tended to be much focused and specialised and carried the professional opinion more freely and forcefully, and often referred to the colonial rule and the hindrances created by it.

In order to provide the indigenous scientific initiative a solid base, research institutes and several professional organisations, besides technical and educational institutions, came up in Bengal, such as, the Bose Research Institute (1917), Science News Association(1934), and National Institute of Sciences of India (1935). The publication of the *Science and Culture* from 1935 in Calcutta as the mouthpiece of the intellectuals and scientists was a landmark event that brought a large band of thinking people together, now

recognised as Science and Culture Group. These events did have an anti-colonial stance; and the Science and Culture Group opposed colonialism and imperialism tooth and nail. Bengali scientists like P.C. Ray, M.N. Saha and J.C. Ghose were active not only in Bengal but all over the country (Sinha, 2008).

For National Reconstruction & Freedom

By mid-1930s, the political situation was much clear: The colonial authorities were on the defensive, and the national movement was surging towards freedom. The bright prospects unfolding ahead encouraged the Indian intellectuals to plan for India's all-round reconstruction. M.N. Saha took the lead. He met with Subhas Chandra Bose, the Congress President, with a proposal in this regard. Thus, Subhas Bose constituted in 1938 the National Planning Committee (NPC). It was a high power committee to draw a 10-year plan for national reconstruction to be implemented as soon as India became free. Jawaharlal Nehru was appointed its Chairman and the best brains of the country were appointed on its 27 sub-countries. The committee worked throughout the Second World War and published its report in 25 volumes during 1945-49 (Shah, 1945-49). The data compiled in these reports and the plans envisaged were later used in the national planning and development programme after India became independent in 1947. M.N. Saha was a leading figure, after Nehru, in this exercise (Kumar, 1991, 1995).

During the World War, the working of the NPC was badly disrupted as the Congress leaders were sent behind the bars after the 1942 outbreak; it was during this period that the scientists rose to the occasion, took over the Congress agenda of reconstruction and carried it forward towards concrete planning and execution. The National Institute of Sciences organised a massive symposium in Calcutta to discuss reconstruction in various walks of life through their corresponding disciplines. This initiative did have a very significant impact on the public opinion, including on the official policy which most favourably leaned towards India's reconstruction and welfare in the last years of the British rule in India. Calcutta was one of the major centres of this exercise and the Bengali intellectuals, including the scientists, were a moving force (Sinha, 2008).

The Second World War and the Bengal Famine of 1943 acted as a catalyst for the anti-colonial opinion in Bengal as well as in the whole country and abroad. Whereas the World War exposed the gross failures of British rule overall, the famine led bare its utter ugliness and the height of miseries of life (Greengough, 1982). It was during this famine that the National Institute of Sciences of India organised the symposium on national reconstruction with reference to science, mentioned earlier. The lectures delivered and the papers presented at the symposium discussed, amongst other things, the contemporary situation and often attributed it to the colonial rule (Nisi, 1944). The Bengali intellectuals highlighted the matter through the press, consolidated the public opinion in the matter, and garnered international support for India's development and Independence. In fact, Saha and his Science and Culture Group took note of colonialism and imperialism not only in India but throughout the world and opposed them in all forms. It is interesting to note that they perceived the dangers of 'Oil Imperialism' and dangers of Imperialism for global environment, in those remote years (Chatterjee, 1986). M.N. Saha was in direct touch with some of the leading scientists of the developed world, especially the Left wing scientists like J.D. Bernal and P.M.S. Blakett (both of Britain), who strongly supported India's cause and were influential in getting wider international support in India's favour. It was in this background that the Government of India called in Professor A.V. Hill to India, who studied the state of affairs here and made an elaborate recommendation on how to promote science and harness it for progress in India (Sinha, 2008).

Meanwhile, some others were also busy building up institutional base to cater to India's technical needs required for national reconstruction. P.C. Mahalanobis (1893-1972) was a leading figure behind this endeavour. Right in the beginning of the last century, he had become interested in what was later called statistics. He found the subject useful for understanding some of the major problems of the country related with population, agriculture and other aspects of life and development. In 1931, he established the Indian Statistical Institute (ISI) in Calcutta. By 1933, its journal, *Sankhya: The Indian Journal of Statistics* was founded on the lines of Karl Pearson's *Biometrika*. Although Mahalanobis was initially introduced to the concept of statistics through the works of the West, he was quick to discover its roots in the traditional indigenous knowledge and philosophy. No wonder he called

his journal *Sankhya*. He believed that the idea underlying the integral concept of statistics found adequate expression in the ancient Indian word *sankhya* and referred to the *Atharva-Veda*, the *Geeta*, *Sankhya* system of philosophy, and to the *Amar-kosa*, to elaborate his point.[9]

He was so charmed by the subject that he could not wait for any state patronage to promote it. He identified the areas for its application and went ahead to promote it with his personal initiative and resources. Without being aggressive towards the colonial government like MN Saha, Mahalanobis quietly tried to apply statistics to some of the basic problems of the country such as those connected with agriculture, flood and population; and instead of depending on the British expertise, he gradually turned to other countries like the USA and Japan, and, later, to the USSR.[10]

Mahalanobis could not overlook the value of the education and training in statistics for the future progress of the country. Soon after its establishment, the ISI started short training courses in statistics from 1932, which were attended by officers on deputation from the government and other organisations from all over India. With initiative of Mahalanobis and active support of Dr Shyama Prasad Mukherjee, then President of the Councils of Post-Graduate Teaching in the University of Calcutta, a course in statistics was introduced there at the postgraduate level in 1941, with Mahalanobis as its Honorary Head.

Mahalanobis did have a special ability for locating talents. He discovered outstanding mathematicians in Subhendu Sekhar Bose, Harish Chandra Sinha, Raj Chandra Bose, Samarendra Nath Roy and others, who raised the Institute to an international stature, earning great recognition, globally.[11] It may be recalled that many scientists groomed around the ISI later joined foreign universities, especially in the USA. Even though it was a brain drain for India, it demonstrated at the same time the resurgence of India's intellectual prowess that eroded the myth of the intellectual superiority of the masters and the West.

Contributions in Retrospect

Obviously, Bengal acted as the hub of the anti-imperialist activities by the scientists and other intellectuals. Not to talk of direct protest against the Raj, even the popularisation of science and intellectual awareness in

Bengal fuelled the struggle against imperialism. The events and developments of the *Swadeshi* days clearly demonstrated the anti-colonial feelings. The later initiatives at professional organisations channelized this feeling into a movement analogous to the political struggle for freedom, both of which complemented and supplemented each other. The Science and Culture Group exposed the demerits of colonialism and generated international support against it.

However, it needs to be noted that until the beginning of the 20th century, Bengal included also Bihar and Orissa whose contributions to the anti-colonial struggle cannot be overlooked. In fact, during the Swadeshi, Bhagalpur and some other towns of Bihar were important centres of activities; and many of the Bengali scientists and intellectuals also lived at such places as Bhagalpur, Patna, Ranchi, Giridih, Cuttack and Puri—situated in later-day Bihar and orissa. It may also be noted that even after the separation of Bihar and Orissa from Bengal, the long relation amongst the three continued and Calcutta still remained the intellectual epicentre in the east. While this connection continued to sustain the anti-colonial activities in Bengal, it inspired and encouraged similar activities in Bihar and Orissa. This aspect of the social history of science in Bengal and India deserves to be studied properly.

Conclusions

More research needs to be done to draw the complete picture. For this, the *Swadeshi* activities even at the grassroots level need to be examined. How did an Indian doctor, a *vaidya* or *hākim* working in rural Bengal feel and act? How did they oppose the British rule? How did the native artisans fare in their crafts and fought the competition from the Western technology. Here, one may have to have a wide and inclusive meaning of the terms ‘scientist’ and ‘technician’, to include in their fold even the practitioners of traditional professions. The Christian missionaries were active in rural Bengal as elsewhere in the country, and were interested in education, public health and, occasionally, in subjects like astronomy. For example, apart from establishing a college at Bankura in West Bengal which exists as Christian College today, Revt. Mitchael, also established an astronomical observatory at this college; and he helped to establish, around 1915, a modern astronomical

observatory at the present L.S. College at Muzaffarpur in Bihar (Sinha, 2005). How did the local professionals deal with them? Queries on these lines may yield valuable information on the indigenous opinion against the foreign rule at the grassroots level. Even a crude technical innovation, a process, an idea or information substituting or competing with the existing ones from the West were a challenge to colonialism and imperialism and an act of opposition to the British rule.

Notes and References

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