

# The Scientist and the Poet: Acharya Jagadish Chandra Bose and Rabindranath Tagore

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## Abstract

This article attempts to explore the scientific discourses of Acharya Jagadish Chandra Bose and Rabindranath Tagore, to whom science did not signify a mechanistic analysis of facts, but rather a broader interpretation, a wider perception of the universe. Having their beliefs firmly rooted to the preachings of the ancient Hindu Upanishads and the Vedas, they conceived Nature not merely as a physical phenomenon, but a living spirit, which could help man to realize the essential Truth of Life.

[**Keywords:** scientist, poet, Nature, truth, life]

In a tribute to his friend, Sir Jagadish Chandra Bose (1858-1937), who died on 23<sup>rd</sup> November, 1937, Rabindranath Tagore (1861-1941) wrote:

Years ago, when Jagadish Chandra, in his militant exuberance of youthfulness, was contemptuously defying all obstacles to the progress of his endeavour, I came into intimate contact with him, and became infected with his vigorous hopefulness. There was every chance of his frightening me away into a respectful distance, making me aware of the airy nothingness of my own imaginings. 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.<sup>1</sup>

Being a poet, and not a specialist in the field of science, though Tagore had always been conscious about his lack of competency in science, he nevertheless acknowledged his keen interest in scientific knowledge and discoveries. In the introduction to his only scientific book, *Vishwa Parichay*, published in 1937, (*Our Universe*), Tagore wrote: "Needless to say, I am no devotee of science, but since childhood I have always been curious about it, deriving endless pleasure from it."<sup>2</sup> This scientific mind of the Poet had been also appreciated by his friend, Jagadish Chandra, as Tagore himself said: "I remember often having been assured by my friend that I only lacked the opportunity of training to be a scientist but not the temperament."<sup>3</sup>

Tagore found Jagadish Chandra to be endowed with a rare faculty of poetic sensibility and imagination, who appeared to him someone more than a scientist:

... to my mind he appeared to be the poet of the world of facts that waited to be proved by the scientist for their final triumph ... in the prime of my youth I was

strongly attracted by the personality of this remarkable man and found his mind sensitively alert in the poetical atmosphere of enjoyment which belonged to me.<sup>4</sup>

Hence, to both Tagore and Bose, there never existed any rigid distinction between science and poetry or more broadly between science and literature. Critiquing the typical Western attitude of making excessive specialization in the field of learning, they sought to locate an underlying unity in all branches of knowledge, to find a 'comprehensiveness of truth' which is the core of Eastern philosophy and religion. In his presidential address at the Bengal Literary Conference in 1911, Bose suggested:

You are aware that, in the West, the prevailing tendency at the moment is, after a period of synthesis, to return upon the excessive sub-division of learning ... Such a caste-system in scholarship, undoubtedly helps at first, in the gathering and classification of new material. But if followed too exclusively, it ends by limiting the comprehensiveness of truth. The search is endless. Realization evades us.

The Eastern aim has been rather the opposite, namely that, in the multiplicity of phenomena, we should never miss their underlying unity. After generations of this quest, the idea of unity comes to us almost spontaneously, and we apprehend no insuperable obstacle in grasping it.<sup>5</sup>

While discussing the path-breaking scientific researches and discoveries of J. C. Bose, this article will attempt to explore how science, in the perception of both Bose and Tagore, transcends the limited canons of Western metaphysics and materialism into a realm of Eastern spiritual cosmology. The article will also make an attempt to focus on the contemplation of Nature by both Bose and Tagore. To both it appeared to be not merely a physical phenomenon, but a living entity, a transcendental spirit which could lead man to realize the presence of an essential sense of unity in the world of apparent chaos and diversity.

In order to contextualize Bose's works within the ideology of Hindu Vedic Religion and Theology, it will be necessary to look at his research career, that can be divided into three broad phases. In the first phase, that is, during the years roughly between 1894 and 1899, Bose had primarily concentrated on traditional styles of research in physics. During these years Bose was involved in the production of the shortest possible electro-magnetic waves and the verification of their quasi-optical properties, through which he could earn acclaim as a scientist, particularly in Europe.<sup>6</sup>

From this conventional mode of research, Bose, in the second phase of his career (roughly between 1899 and 1902), ventured to go beyond orthodox physics and the traditional methods of science laid by the West, to draw some interesting correlations between the living and the non-living world.<sup>7</sup> It is through this interdisciplinary approach to science that Bose sought to introduce an Eastern spirituality within a materialist Western science and thereby sought to establish a new scientific paradigm to create 'a new East for the West to appreciate.'<sup>8</sup> While working with his electric wave receiver, Bose became

preoccupied with the question of responses to electric touch upon various objects and went on to compare metallic fatigue and excitation with that of excitation in living tissue.<sup>9</sup> Thus he pursued in a research to draw a link between the animate and the inanimate in their responses to electric stimulus, and wrote his seminal book, *Responses in the Living and Non-living* (1902).<sup>10</sup> This project of Bose served to fulfill two crucial purposes: firstly, to contest the Western stereotypical image of India as 'a nation of dreamers', by leaving a distinctly Indian imprint in the corpus of modern science; and secondly, to widen the worldview of modern science and to bring a refreshing spirit to the excesses of Western scientific methodology by infusing the Eastern spiritual resources and Vedantic beliefs which proclaim the ideal of the Unity of Life.

Rabindranath Tagore, who had always been an avid supporter of Bose's researches and discoveries, found in his works an essence of Indian scientific spirit, a reflection of Indian national culture, its national pride and heritage. In his poem for Bose, published in *Kalpana*, Tagore, addressing the scientist, was effusive in his praise:

From the Temple of Science in the West,  
far across the Indus,  
oh, my friend, you have brought  
the garland of victory,  
decorated the humbled head  
of the poor Mother ...

Today, the mother has sent blessings  
in words of tears,  
of this unknown poet.  
Amidst the great Scholars  
of the West, brother,  
these words will reach only your years.<sup>11</sup>

In his letter to Tagore, dated 29<sup>th</sup> November, 1901, Bose acknowledged his responsibilities as a scientist to revive the national pride of his country:

I am alive with the life force of the mother Earth, I have prospered with the help of the love of my countrymen. For ages the sacrificial fire of India's enlightenment has been kept burning, millions of Indians are protecting it with their lives, a small spark of which has reached this country (through me).<sup>12</sup>

Bose's discoveries on electric responses, which were premised on challenging the distinctions between the living and the non-living, actually reiterate the ideals of Hindu Vedic Monism that asserts a sense of unity and strength, a grand cosmic unity within the diversity. In this respect, Bose was considerably influenced by Rammohun Roy, who is often designated as the pioneer to rediscover and identify this essential monism within Classical Indian thought, and who according to Bose, was the first to see the 'Unity of All Intellectual Life', and the 'importance of absolute freedom in all fields of inquiry'.<sup>13</sup>

In addition to Rammohun, it was perhaps Bose's growing friendship with Tagore that actually drew the former much closer to the Vedic monistic philosophy. Through his strong 'Brahmo' roots, Tagore had been already initiated to the monism of the Vedas, where the diverse living world was considered a single entity. The Poet expressed this when he commented: "I was made familiar from my boyhood with the Upanishad which, in its primitive intuition, proclaims that whatever there is in this world vibrates with life, the life that is one in the infinite."<sup>14</sup> In 1931, on the occasion of Tagore's seventieth birthday, Bose confessed, how the Poet had influenced his ideas and his work, opening before him a wider view of life:

His friendship has been unfailing through years of my ceaseless efforts during which I gained step by step—a wider and more sympathetic view of continuity of life and its diverse manifestations.<sup>15</sup>

Having his beliefs firmly rooted to the monistic cosmology of Vedas, Bose's discoveries regarding the responses of the living and the non-living could be defined as a manifestation of classical Indian spirituality. In his discourse to the Royal Society, on 10<sup>th</sup> May, 1901, Bose stated:

It was when I came upon the mute witness of these self-made records, and perceived in them one phase of a pervading unity that bears within it all things—the mote that quivers in ripples of light, the teeming life upon our earth, and the radiant suns that shine above us—it was then that I understood for the first time a little of that message proclaimed by my ancestors on the banks of the Ganges thirty centuries ago—

'They who see but one, in all the changing manifoldness of this universe, unto them belongs Eternal Truth--unto none else, unto none else!'<sup>16</sup>

This sense of an 'all pervading unity' had been also echoed by Tagore in the concluding chapter of his book, *Vishwa Parichay (Our Universe)*, where he tried to find a possible link between the inanimate and the conscious world through the presence of an all pervading radiation and energy.<sup>17</sup> Tagore wrote:

We can imagine that if there is any root similarity between the inanimate world and the conscious world, it must be the all-pervading energy, or the heat in matter. After a considerable time science has discovered that when we look at matter, however, inert it may seem superficially and devoid of sparks, there is a kind of illuminating process that goes on unobtrusively within it. This illuminating spark in its subtle form manifests itself in life; moreover, it manifests itself further in yet a subtler form in consciousness and mind. As we find there is nothing but this great luminous spark in the beginning of creation, we have to own that this consciousness is its manifestation. By raising layers of coverings one by one from the inanimate to the animate, it is constantly aiming to unfold this greater consciousness in man by gradually removing all its shrouded veils. This evolved freedom of consciousness is perhaps the ultimate destiny of creation."<sup>18</sup>

This new discourse of science, that had been formulated by both Bose and Tagore, articulates the ideals and values of the Vedas and the Great Hindu Upanishads, through which the boundaries between the animate and the inanimate, the physical and the physiological, the internal and the external, are all dissipated, as Bose contended: “The struggle between the inner and the outer has manifested life in its various forms. At the root of both is that great power, which stimulates the living, the non-living, the molecules, and the entire universe. Life is an expression of that power.”<sup>19</sup> This realization of the Eternal Power of Life was also evoked in the mature voice of Tagore in his book, *Sadhana (The Realization of Life)*, 1913):

In India men are enjoyed to be fully awake to the fact that they are in the closest relation to things around them, body and soul, and that they are to hail the morning sun, the flowering water, the fruitful earth, as the manifestation of the same living truth which holds them in its embrace. Thus the text of our everyday meditation is the *Gayatri*, a verse which is considered to be the epitome of all the Vedas. By its help we try to realize the essential unity of the world with the conscious soul of man; we learn to perceive the unity held together by the one Eternal Spirit, whose power creates the earth, the sky, and the stars, and at the same time irradiates our mind with the light of a consciousness that moves and exists in unbroken continuity with the outer world.<sup>20</sup>

The third and the final phase of Bose’s research could be characterized as the continuation of his endeavour to search for the Unity of Life, in which he attempted to bridge the gulf between the inanimate and the animate worlds by positing the plant world as the progressive connecting link. This phase of Bose’s research thus promised to collapse the further existing barriers between different fields of scientific research, thereby strengthening his commitment to his Vedantic belief in cosmic unity.<sup>21</sup> In his letter to Tagore, dated 30<sup>th</sup> August, 1901, Bose wrote:

There is a great gap between the living and the non-living, and I was experimenting on the responses on plants to make a connection between the two. Just now I got the amazing results; Same, Same, all are the Same!<sup>22</sup>

This depiction of Nature, as a means to realize the essential unity in all existence, had been also evoked by Tagore in many of his writings. In his essay, ‘The Relation of the Individual to the Universe’ in *Sadhana (The Realization of Life)*, the poet said:

In ancient India we find that the circumstances of forest life did not overcome man’s mind, and did not enfeeble the current of his energies, but only gave to it a particular direction. Having been in constant contact with the living growth of nature, his mind was free from the desire to extend his dominion by erecting boundary walls around his acquisitions. His aim was not to acquire but to realize, to enlarge his consciousness by growing with and growing into his surroundings. He felt that truth is all-comprehensive, that there is no such thing as absolute isolation in existence, and the only way of attaining truth is through the interpenetration of our being into all objects.<sup>23</sup>

The two most significant books that Bose wrote in the field of Plant Physiology were, *Plant Response as a Means of Physiological Investigation* (1906) and *Comparative Electro Physiology* (1907). In these works Bose sought to find similarities between plants and animals for which he directed his investigation to obtain evidence of responsive mechanical movements in plants. Thus through his experiments, Bose established that the conduct of excitation in plants is fundamentally the same as that in the nerves of an animal.<sup>24</sup> At a later period, Bose wrote another book on Plant Physiology, called, *The Nervous Mechanism of Plants* (1926), and dedicated the volume to 'My lifelong friend Rabindra Nath Tagore.'<sup>25</sup> In reply to this, the Poet said: "as soon as I took the book you dedicated to me in my hands, I realized this is where our truth lies, this light, this life--this is India's essence."<sup>26</sup>

It is through his researches on plant physiology that Bose had brought into light some extraordinary revelations in plant life—such as, nervous impulses, throbbing pulsation, response to stimuli, intoxication—through which he tried to forge a link between the world of plants with the world of animals and even with that of the humans:

The plant is not a mere mass of vegetating tissue, but that its every part is full of sensibility. We are able to record the throbbings of its pulsating life, and find these wax and wane according to the life conditions of the plant, cease with the death of the organism ... the life-reactions of plant and man are alike; thus through the experience of the plant it is possible to alleviate the sufferings of man.<sup>27</sup>

This sensitive appreciation of Nature and its intimate bond with the human was a lingering concern for Rabindranath from the very early stage of his life:

I have expressed my belief that the First stage of my realization was through my feeling of intimacy with Nature ... not that Nature which has its channel of information for our mind and physical relationship with our living body, but that which satisfies our personality with manifestations that make our life rich and stimulate our imagination in their harmony of forms, colours, sounds and movements.<sup>28</sup>

Comparing the West's depiction of Nature with that of the East, Tagore expressed the same ideas in his book, *Sadhana (The Realization of Life)* too:

In the West the prevalent feeling is that nature belongs exclusively to inanimate things and to beasts, and that there is a sudden unaccountable break where human-nature begins ... But the Indian mind never has any hesitation in acknowledging its kinship with nature, its unbroken relation with all ... The earth, water and light, fruits and flowers, to her (the East or India) were not merely physical phenomena to be turned to use and then left aside. They were necessary to her in the attainment of her ideal of perfection, as every note is necessary to the completeness of the symphony.<sup>29</sup>

Much before Bose had made his discoveries on electric touch, he had been very much interested in the secrets of plant life--their inarticulate voices, their birth and death. In this respect, Bose had time and again acknowledged his indebtedness to Tagore, who had been a driving force in moulding the former's perception of the world, his sensitivity and imagination. Bose confessed:

It was following this quest that I succeeded in making the dumb plant the most eloquent chronicler of its inner life and experiences by making its own history ... The barriers which seemed to separate kindred phenomena was found to have vanished, the plant and the animal appearing as a multiform unity in a single ocean of being ... The same cosmic unity has unfolded to Tagore's poetic vision and has found expression in his philosophic outlook and in his incomparable poems...<sup>30</sup>

Jagadish Chandra Bose's interest in plant physiology might have been also prompted by his growing intimacy with the European neo-vitalists, like Patrick Geddes and others, who formulated a new kind of science that refused to submit to the mechanistic interpretation of the world and spoke for a spiritual kinship with nature. By making the dumb plants speak, Bose attempted to restore the lost mysticism in science and thereby aimed to humanize its mechanical worldview. Describing the sense organs of a tree, Bose in his *Plant Autographs* (1927), wrote:

Whence did the tree derive its strengths by which it emerges victorious from all pain? It is the strength derived from the place of its birth, its power of perception and quick readjustment to change and its inherited memories of the past.<sup>31</sup>

This metaphor of life in a tree had been also evoked by Tagore in his poem, *Briksha- Bandana (Homage to the Tree, 1926)* in *Bonobani*, where 'the Tree is depicted as a heroic figure that brings life to the universe in triumphing over dreariness.'<sup>32</sup> Tagore hailed the Tree:

From the deep bowels of the earth you heard  
The call of the Sun, O Tree, you witnessed  
The first beat of life, you uttered  
The call of life in the dreariness.  
Brave son of the earth, you declared  
War to liberate the soil from the  
Sterility of the desert; the battle continues  
To establish the throne of the green  
On every page of rock  
You extend your path to every space.  
Your life and shade sustain me  
I come forward, a messenger of Man;  
Dressed in your garland I offer,  
My poetry to you as my humble offering.<sup>33</sup>

To Tagore, Nature had always appeared as a living entity, a transcendental spirit, a Divine force that shapes and moulds the life of a man and

is integral to human civilization. In his poem, *Basundhara (Mother Earth, 1893)* in *Sanchayita*, Tagore addresses the Earth as the Mother who is the source of sustenance in man's life:

Take me back to your lap O Earth  
 Bless me within your shadow  
 I exist within your beauty and radiate  
 Myself all around life the joy of spring  
 Quivering, gurgling, radiating myself  
 With the rays of light I flow in joy  
 To the far corners of the earth  
 In joyous play I extend  
 Language to every wave and direction  
 I spread myself on the pinnacles  
 Of the snowy cliffs in silence  
 O Earth my heart has sung aloud  
 In joy, aspired to clasp you close to me  
 To kiss every single bud, to embrace  
 Every blade of grass  
 The joy of the whole world  
 I wish to feel with all of mankind  
 Clasp me close to your heart  
 Where joy evolves in every beat  
 In Every nook and corner  
 Do not keep me away.<sup>34</sup>

This sensitive and mystic appreciation of Nature, later drove Tagore to establish Visva-Bharati, his educational institution at Santiniketan, where Nature was very much a part and parcel of the educational curriculum. Deviating from a mechanistic mode of bookish education, Tagore wanted his students to develop an intimate communion with Nature, which could serve the role of a teacher, a guide in moulding the personality of a child; the kind of sentiment that William Wordsworth too expressed in his poems. The boundless sky of Santiniketan, her open-air classes under the shadows of trees, as well as the various festivals celebrating Nature - like the Spring festival- *Basanta Utsav*, the rain festival- *Barshamangal*, the furrowing ceremony- *Halakarshan*, and the tree planting ceremony- *Briksharopan*---all aim to create an intimate organic relation between Nature and Man, as Tagore said:

I established my institution in a beautiful spot, far away from the town, where the children had the greatest freedom possible under the shade of ancient trees and the field around open to the verge of horizon.  
 From the beginning I tried to create an atmosphere which I considered to be more important than the class teaching. The atmosphere of nature's own beauty was there waiting for us from a time immemorial with her varied gifts of colours and dance, flowers and fruits, with the joy of her mornings and the peace of her starry nights ... we ought to acknowledge its compelling invitation.<sup>35</sup>

Hence, from this perspective it could be said that, science, in the discourse of both Bose and Tagore, did not remain confined to a particular territory, but rather through its assimilation of all the branches of knowledge, it acquired a new spiritual cosmology. Through their contemplation of Nature as a living spirit, Bose and Tagore had at once critiqued the extreme materialistic aspect of Western scientific methodology and simultaneously reiterated the essence of ancient Indian spirituality which is manifested in the belief of the Unity of Life.

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