

## A Humanitarian and a Great Indian<sup>‡</sup>

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<sup>‡</sup>A personal tribute to him on his birthday (November 5), 2015.

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Accepted: January 22, 2016

His mother wrote “I taught him to read quite early—partly in self-defence, for when he became absorbed in a book he ceased to ask questions.” To prove to him that methane was lighter than air and to demonstrate the effects of breathing methane, his father took him crawling into a mine, asked him to stand up and recite Mark Anthony’s speech from Shakespeare’s *Julius Caesar*. “Friends, Romans and Countrymen” . . . he soon began to pant . . . about the time he reached “the noble Brutus,” he collapsed, but regained himself because the air on the floor was all right. Just before the declaration of Hitler’s war, the submarine H.M.S. Thetis, while on trial, sank off the coast of Liverpool and 91 lives were lost. He started an experiment in which he simulated the conditions on board the Thetis and had himself sealed in so that the atmosphere he breathed should be exactly the same as that breathed by the crew of the submarine. “He said that it would be some comfort to the friends of the crew when he was able to report that his sensations were never painful: that he ‘quickly lost consciousness’ and would have passed away without any pain or fright,” his mother wrote in her memoirs titled *Friends and Kindred*.

I remembered these stories when my wife and I were recently on a bus-ride through the villages of Scotland. Our bus was going through a village called Balloch, near the famous Loch Lomond, when I spotted a sign “Balloch and Haldane Community Council.” A Haldane, whom I have never met, is one of my heroes. But more about that later. As the bus moved through the village, I saw the name of Haldane appear a few more times in different places in the village. I wondered whether this was my hero.

I returned to Kolkata and wrote to the Secretary of the Community Council, Mr J Biddulph, seeking information about the Haldane. He replied “The Balloch and Haldane Community Action Plan’s name is taken from the village of Balloch and within the area is a housing area called the Mill of Haldane which is near the site of the once Mill. I believe that the Mill (no longer there) was owned by the Haldanes and the place name Haldane handed down through the ages.” I also wrote to Jo Sherington, Local History & Reference Librarian at

the Heritage Centre of Dumbarton Library, who sent me an article from the magazine *The Scottish Field* written by Brodrick Haldane titled “The Haldanes.” This article referred to Balloch and traced the ancestry of the Haldane family. Toward the fag end of the article the author mentioned of a respiratory physiologist John Scott Haldane. This respiratory physiologist was the father of my hero, John Burdon Sanderson, JBS. I felt good for having been able to “discover” the ancestral village of my hero.

Today, November 5, is celebrated in England as Guy Fawkes Day. On this day in 1605, the Catholic dissident Guy Fawkes and his friends had planned to blow up King James I of England during the opening of Parliament. The plot failed. On the night before, in a cellar below the House of Lords, Fawkes was found lurking beside 36 barrels of gunpowder. To celebrate the failure, residents of London began to light bonfires. A few months later Parliament declared November 5<sup>th</sup> a public day of thanksgiving. Though originally anti-Catholic in tone, from the 19th century, the Guy Fawkes Day celebrations became nonsectarian in nature. A refreshing change!

JBS was born on this day in 1892. He had strong connections to our city, Kolkata. His great-grandfather James sold much family property to raise money for a Mission in Bengal. He adopted Indian citizenship and came to live in Kolkata. My introduction to JBS was through a set of newspaper clippings from *Amrita Bazar Patrika*, an English daily published from Calcutta that discontinued its publication in 1986. These clippings comprised the serialized printed version of the Sardar Vallabhbhai Patel Lecture titled “The Unity and Diversity of Life,” that JBS had delivered in 1957, which was broadcast on the All India Radio. My father, himself a marine fisheries scientist, had cut and saved these articles. I read these articles when I was in Class VIII. What a fantastic set of articles covering the breadth and depth of biology, with a lot of philosophical ideas thrown in. I have since reread them many times. Haldane was a popular exponent of science *par excellence*. He could explain extraordinarily difficult scientific concepts with extraordinary lucidity. “D’you think I didn’t have to

work for it?" was his fierce response to a colleague who commented on his lucid style.

J.B.S. Haldane made a deeper impact on me after I joined the Indian Statistical Institute (ISI). After a few brief visits to India in quick succession, Haldane accepted Prasanta Chandra Mahalanobis's invitation and moved to India to join the ISI, Calcutta, as a Research Professor in 1957. He left the Institute in 1962 and after a brief period of employment with the Council of Scientific and Industrial Research, New Delhi, he moved to Bhubaneswar to start his own Genetics and Biometry Laboratory. When in 1970 I joined ISI as an undergraduate student, Haldane had already passed away. He died on December 1, 1964, at the age of 72. On his prior instruction, his corpse was sent to Rangaraya Medical College, Kakinada, to be used for medical research and teaching. "I don't really very much care what people think about me, especially a hundred years hence, . . . what matters, in my opinion, is what I have done, good or evil, and not what people think of me." he had stated. His biographer, Ronald Clark, stated that among the comments which arrived after his death, he would have been proud of one above all others: "Not only an eminent scientist," it ran, "but also a humanitarian and a great Indian."

Haldane was the chief architect of the undergraduate program in ISI. ". . . the integrated teaching programme which we have could not have been put through, I'm almost certain, without his very massive support," said the founder of ISI, P.C. Mahalanobis. Today many Indian institutions boast of integrated teaching programs, but ISI was the first institution in India to have implemented such a programme; thanks to the ideas and efforts of J.B.S. Haldane and P.C. Mahalanobis. In his speech delivered on the occasion of the inauguration of this integrated teaching programme, Haldane lamented that in Indian universities "students who choose a biological course must give up the study of mathematics, not to mention statistics, at an early stage. This means that graduates in the biological sciences are automatically debarred from most of the types of research, which would be of value in developing our agriculture and husbandry." Since I did not get to meet Haldane, his impact on me was through some of his students who were my teachers in ISI. The most notable among them was T.A. Davis, who was a very active quantitative observational biologist. Haldane advised that "if you want to excel in science, try to develop the habit of quantitative thinking" and that ". . . it is your duty to begin thinking statistically about anything that can help your country and the world." Quantitative biological research in India gained a major impetus with Haldane's move to India.

Haldane—along with Sewall Wright and Ronald Fisher—was a pioneer in using mathematical approaches to the study of evolution. However, many evolutionary biologists preferred to use verbal, instead of mathematical, reasoning

in understanding adaptation by natural selection. When Ernst Mayr attacked (Mayr 1963) the use of mathematical and quantitative approaches to the study of evolution, Haldane was at his argumentative best in defending these approaches (Haldane 1964).

Haldane was aware that in many communities in India, especially in southern India, uncle–niece and cousin marriages are preferred. However, estimates of frequencies of such marriages and their adverse genetic impacts on children were unavailable. In a major project undertaken in Andhra Pradesh by two of Haldane's students, these frequencies and impacts were estimated. This study prompted Haldane to develop a new statistical test of significance of the inbreeding coefficient of a population. Later, upon the advice of Haldane, data on frequencies of various types of related marriages were collected at the all-India level during the 1961 decennial census of India, thus providing a valuable database for human genetics research in India.

In 1949, in a landmark paper entitled "Disease and evolution," Haldane suggested that it is an advantage for a species to be biologically diverse and even to be mutable for genes conferring disease resistance. He suggested that serological and biochemical diversity in human populations may correlate well with disease resistance. To test this hypothesis, Haldane guided and supported a student to carry out genetic studies in human populations living in malarial endemic regions of south India. This and subsequent studies have shown that, to a large degree, Haldane's hypothesis was correct.

Haldane acknowledged that he made many discoveries in India, of which the most important were "the discoveries of a number of younger men than myself who, I think, are in the great tradition of scientific research . . . I am enormously impressed by the great fund of scientific ability which exists in this country." In Haldane's own words (written in a letter to Mr Harrison Brown, Foreign Secretary, US National Academy of Sciences, in 1964, upon being elected to the Fellowship of the Academy): "Since I have done little independent work in the last seven years, I venture to hope that my election is in part a recognition of the research done by my colleagues in India."

I heard many stories about Haldane in ISI. One interesting story that I heard from T.A. Davis's wife, Eunice, was that on a sultry afternoon Haldane told Davis "My great grandfather was a priest, my father used to read the Bible daily, but I am opposed to the practice of the majority of Christians and I hope to meet Christ in a far different manner. I know, the person Christ, was a far better person than we are informed through the scriptures." She also showed me a letter that Haldane had written to T.A. Davis on April 1, 1963; Haldane wrote "The stupidity of the *mynah* shows that in birds, as in men, linguistic and practical abilities are not very highly correlated. A student who can repeat a page of a text book may get first class honours, but may be incapable of doing research."

James Crow, a renowned population geneticist who knew JBS reasonably well, wrote "Of all biologists of his period, or perhaps any period, Haldane came closest to the ideal of a polymath. Haldane was (also) a man of paradoxes. I think the greatest paradox is this. In science, Haldane was the most open-minded of men, able to see and appreciate all points of view, and treating them all generously. He was as undogmatic as anyone could be. Yet in virtually every other walk of life, and in politics in particular, he was dogmatism incarnate." Haldane had taken membership of the Communist Party in 1942.

In remembering my hero on his birthday, I would like to end with a hilarious story that was narrated by his mother (in "Friends and Kindred"). JBS, Jack as he was called by members of his family, took the examination for the King's

Scholarships. "What about the maths paper?" "Stiff and much too long," Jack answered. "Did you finish it?" "No fear! It was much too long," Jack repeated. "I thought you told me you had done the last question." "Yes," said Jack. "But you say you did not finish the paper." "Oh I did not touch the first questions. They were marked too low to be worth doing. I began with the last."

### Literature Cited

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Associate editor: Bill Martin

J. B. S. Haldane,  
P. C. Mahalanobis and  
Niels Bohr  
(19 January 1960)

