

# J. B. S. Haldane: His life and science

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## Introduction

J. B. S. Haldane, the centenary of whose birth falls this year, was a remarkable human being. Today he is remembered mainly for his work on evolution, but that is because first-rate work in several other areas, each enough to make the reputation of a biologist by itself, pales in comparison with his work on evolution. His contributions to developing a quantitative theory of evolution were fundamental. Haldane was a superb popularizer of science; a strong believer in rationality; a Marxist; exuberantly boyish in many of his ways; chronically distrustful of power, authority and bombast; prickly at times but unselfish, kind and gentle at others. To talk about Haldane is at the same time easy and difficult. Easy, because of the huge amount of material available: a competent full-length biography by Clark, shorter reminiscences, anecdotes and notices by many others, pieces by Haldane himself—I include in this both purely autobiographical writing as well as popular essays—and, not the least, an immense amount of published scientific work carried out for well over 50 years. I do not need to elaborate on the point that this very richness of sources makes the problem of choosing what to say a difficult one. Like all great scientists, Haldane had more up his sleeve than the material he published (for example, an unpublished note—just discovered—shows that Haldane had worked out an approximate but fairly accurate solution to the problem of calculating the distribution of spontaneously occurring mutants, a problem made important by the experiments of Luria and Delbrück). I have organized this essay as follows: After a brief sketch of his life, I will try to give you a feeling for Haldane's contributions to science. As part of this, I will mention instances of Haldane's ability to anticipate future developments. Next I shall deal with Haldane the

communicator, especially the writer of popular articles. Many of Haldane's writings were for the *Daily Worker*, a Communist newspaper, and I will touch upon Haldane the Marxist. This, at least in the version popularized by himself, leads naturally to the subject of Haldane in India. I end with quotations from two philosophical essays by him.

## A brief life-sketch

John Burdon Sanderson Haldane was born on 5 November 1892. His father, John Scott Haldane, was by then well on his way to being recognized as an authority on physiology, especially the physiology of respiration, and JBS's first steps in science were taken as an infant guinea pig in his father's experiments. Haldane was a precocious child, able to read by three and write by five. According to D'Arcy Thompson, already as a toddler he handled and studied objects with a scientific expression. Precocity was combined with a remarkable memory (even in later years Haldane had no need, it is said, to look up scientific references when writing his papers), intellectual brilliance and a strongly pugnacious nature. A fight was never far off when Haldane was around; again, a feature which endured all his life. After his preparatory school, where he had the reputation of teaching mathematics to the mathematics master, he went to the Eton 'Public' school, where he was extremely unhappy. One wonders how much this early exposure, to what must have been a snobbish and exclusive environment, was responsible for his life-long anti-establishment attitude. Oxford, which he enjoyed, followed. Here he studied mathematics, the European classics, and philosophy. Haldane never took a degree in biology. His love of what we would call the 'Arts' was enduring, and his writings are studded with quotations from Greek and Latin, Christian theology, and, later in life, from Hindu scriptures. Active service in the first world war (the absence of capital letters in 'world war' is a Haldanism),

which he thoroughly relished, came next. After the war, a string of British academic appointments followed one after the other: Fellow at Oxford (1919–1922), Reader in Biochemistry in Gowland Hopkins' department, at Cambridge (1922–1932); 'Officer-in-charge of Genetical Investigations' at the John Innes Horticultural Institution (1927–1936), Professor of Physiology at the Royal Institution (1930–1932) and Weldon Professor of Biometry at University College, London (1937–1957). As the dates indicate, for a period Haldane held three part-time positions. He was married twice. His first wife, Charlotte, was a novelist and journalist; the second wife, Helen Spurway, was a geneticist and student of animal behaviour. JBS and Helen Spurway migrated to India in 1957 and stayed there for seven years. Haldane's initial appointment was at the Indian Statistical Institute in Calcutta. He moved from Calcutta to the Orissa Genetics and Biometry Laboratory in Bhubaneswar, where he died on 1 December 1964. Helen Spurway carried on with her researches in India and survived her husband by twelve years. Haldane did not have any children.

## Early science

Before discussing Haldane's contributions to our understanding of how evolution operates, a word about his early work. While still a school boy he had begun helping his father in physiological experiments. These were mainly concerned with respiration under conditions of deep-sea diving and working in mines. The experiments continued during the first world war, when the problem of devising an effective gas mask was acute. The work was risky; JBS took part in it, with an almost reckless disregard for his own health and safety, a disregard encouraged by his father. The most remarkable piece of research carried out by the young Haldane dates from his recognition, when a boy of just 16, that certain of the data presented in