

A victim of truth

Vitalism was an attempt to reconcile rationality with a sense of wonder.

Sunetra Gupta

Convictions, said Nietzsche, are more dangerous enemies of truth than lies. Among the catalogue of convictions that the human race has challenged and eventually relinquished is the fascinating notion that living organisms are distinct from nonliving entities by possessing a 'vital force'. The philosophy of 'vitalism' has its roots in the original distinction between organic and inorganic compounds, dating from around 1600, which was based on their reaction to heat. Although both types of substance changed form when heated, inorganic compounds could be recovered upon removing the heat source, whereas the organic compounds appeared to undergo a mysterious and irrevocable alteration.

The implication that the latter were imbued with a vital force gave birth to an idea that eventually came to occupy a very tricky position between materialism and idealism by endorsing the viewpoint that, although organic material might obey the same physical and chemical laws as inorganic material, life could not be governed by these laws alone.

Vitalism's singular place in history rests on its attempt to reconcile two opposing needs — the need for analytical reasoning and the need to celebrate the mystery of human experience. The life of the Swedish chemist Jons Jacob Berzelius (pictured on the right) traced the tensions between these concerns in dramatic detail.

We are accustomed to thinking of the defining event in Berzelius's life as the letter from his student that declared: "I must tell you that I can make urea without the use of kidneys, either man or dog." The year was 1828 and Friedrich Wohler, in setting out to synthesize ammonium cyanate, had obtained a white crystalline material which proved identical to urea. It was the first organic compound to be synthesized from inorganic starting materials, and the achievement knocked down one of the few

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remaining tenets of vitalism — that although organic chemicals could be modified in the laboratory, they could only be produced through the agency of a vital force present in living plants and animals.

Berzelius apparently tried to downplay Wohler's discovery by exiling urea to a hinterland between organic and inorganic compounds. An alternative school of thought proposes that his lack of enthusiasm had more to do with the problems it posed for his own theory of inorganic compound formation. At any rate, the event struck many, including Wohler himself, as being more remarkable in demonstrating how a salt (ammonium cyanate) could reconstitute itself into an organic substance with the same empirical formula.

By deflecting the issue towards the structural implications, Berzelius was able to maintain a dignified silence on the question of vitalism, leaving us with room to speculate about what the discovery might really have meant to him personally. During his long encounter with chemistry he vacillated between stances that are clearly supportive of a mystical vitalist force and others that are more accommodating of an atheistic materialism, which he generally abhorred. It appears that much of his energies as a chemist were engaged in the honest negotiation of a compromise between these two poles.

Vitalism did not die with the synthesis of urea, but its boundaries were pushed back a little further. Vitalists now began to contend that it was an organism's functioning rather than its constituent substances that lay outside the boundaries of human comprehension. Berzelius, in his final analysis, acknowledged that the notion of a vital force as distinct from normal inorganic forces was invalid; instead, organisms were to be distinguished by a mysterious arrangement of "circumstances" dictated by the (divine) purpose of producing life. By the early twentieth century, the focus of vitalism had shifted to



MARY EVANS

another set of circumstances — namely, the development of an organism. Known as entelechy, the concept that a vital force accounts not only for the maintenance of life but also for its development was used by the vitalist Hans Driesch to explain the astonishing process of embryonic differentiation.

Are where are we today in this process of gradual erosion? We now have a 'working draft' of the human genome and still the engineers of such a feat are anxious to emphasize "the imponderables of the human spirit". It seems that we are still — perhaps happily so — trapped in a state of poetic ambivalence towards the question of whether life is greater than the sum of its parts. Like Berzelius, we remain inclined to believe that the analysis of life does not detract from its ultimate mystery. ■

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