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A Computational View of the Historical Controversy on Animal Electricity

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ABSTRACT

A scientific controversy retains often some controversial sides after its fundamentals has well been explained. This is particularly true for the controversy that arose in Italy in the second half of the eighteen century between the anatomist Luigi Galvani, and the physicist Alessandro Volta, around the intrinsic nature of nerve and muscular function. The two scientists were providing, almost simultaneously from the University of Bologna and Pavia respectively, two quite different explanations for the property of muscles of being electrically excitable and contract as a consequence. Science seemed then to touch the very intrinsic mechanism of living processes. Despite the fact that one of the two explanations was explaining better than the other, the weaker mechanism won the battle at the time. The biophysical mechanism of nerve excitability has then been clarified in 1950 by Hodgkin and Huxley, who later won the Nobel prize for their work. They unequivocally showed that Galvani was right and Volta quite wrong. Only specialists though notice that the Galvani-Volta controversy is frequently still thought wrong in schools. In this brief essay I want to show how easy-to-handle computer models can unveil where the subtle source of the controversy was hidden, and how an interdisciplinary approach can help drawing light into the multiple aspects of this extraordinary story.

KEYWORDS

Animal Electricity; Galvani-Volta Controversy; Computational Physiology; Excitability

Cite this paper

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