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Priestley's Shadow and Lavoisier's Influence: Electricity and Heat in the Late Eighteenth and Early Nineteenth Centuries

AMY FISHER, University of Puget Sound

In the late eighteenth century, Joseph Priestley argued that any complete theory of heat also had to explain electrical phenomena, which manifested many similar effects to heat. For example, sparking or heating a sample of trapped air caused a reduction in the volume of air and made the gas toxic to living organisms. Because of the complexity of electrical and thermal phenomena, Antoine Lavoisier did not address electrical action in his published works. Rather, he focused on those effects produced by heating alone. With the success of Lavoisier's caloric theory of heat, natural philosophers and chemists continued to debate the relationship between heat and electricity. In this presentation, I compare and contrast the fate of caloric in early-nineteenth-century electrical studies via the work of two scientists: Humphry Davy in Britain and Robert Hare in America.