DISCUSSION AND CORRESPONDENCE

DID HUMPHRY DAVY MELT ICE BY RUBBING TWO PIECES TOGETHER UNDER THE RECEIVER OF AN AIR PUMP?

IT is commonly stated that Humphry Davy melted two pieces of ice by rubbing them together under the exhausted receiver of an air pump, and thus showed conclusively that heat is not a material substance. In books which I happen to have at hand I find twelve different authors stating that Davy melted two pieces of ice by rubbing them together in a vacuum, and four of them stating in addition that the two pieces of ice were rubbed together by clockwork. In looking to see what Davy himself said about this experiment I have, to my surprise, failed to find any evidence that he ever performed just this experiment.

Of the authors whom I consulted, four give references. Two refer to the Collected Works of Sir Humphry Davy, vol. 2, p. 11. The other two refer to Davy's Elements of Chemical Philosophy. In the Elements of Chemical Philosophy, reprinted as Volume 4 of the Collected Works, I have not found any statement about the melting of ice by friction. In the first paper in Volume 2 of the Collected Works Davy describes twenty-two experiments and makes comments on them.

In Experiment 2, p. 11, he describes an experiment in which "by a peculiar mechanism" he caused two blocks of ice to rub together. "They were almost entirely converted into water." In the description of this experiment nothing is said about any air pump.

The description of the third experiment is not entirely clear. Davy says, "I procured a piece of clock-work so constructed as to be set to work in the exhausted receiver; one of the external wheels of this machine came in contact with a thin metallic plate. A considerable degree of sensible heat was produced by friction between the wheel and plate when the machine worked uninsulated from bodies capable of communicating heat. I next procured a small piece of ice; round the superior edge of this a small canal was made and filled with water. The machine was placed on the ice, but not in contact with the water. Thus disposed, the whole was placed under the receiver. . . . . The receiver was now exhausted. . . . . The machine was now set to work. The wax rapidly melting, proved the increase of temperature."

From this description it seems that the clockwork was not a mechanism for rubbing two pieces of ice together, but was used to produce friction between two metals, and that the heat developed by this friction caused the melting of some wax.

Any clockwork which Davy might have placed inside of the receiver would probably not have been sufficiently powerful to melt ice rapidly by rubbing it on ice. I have wondered if some author did not read the second experiment, glance at the third, and seeing the words *clockwork, exhausted receiver, ice* conclude that two blocks of ice were rubbed together by clockwork under the exhausted receiver. If so, this is an interesting illustration of the ease with which a misstatement may pass from one author to another. If there is evidence that Davy did melt two blocks of ice by causing clockwork to rub them together under the receiver of an air pump I hope some one will adduce it.

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SMITH COLLEGE,
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A PARACELSUS LIBRARY IN THIS COUNTRY

IN your issue of February 10, F. N. Garrison announces a new prospective publication in Germany of the complete works of Paracelsus, that great pioneer in analytical chemistry and medical reformer of the sixteenth century. It may not be generally known that what is no doubt the largest and most complete collection of the works of Paracelsus in this country is the one made during the last century by the late Dr. Constantine Hering of Philadelphia, and since his death in 1880 was ac-