X.—*Note on the employment of Electrical Currents, for ascertaining the Specific Heat of Bodies.* By J. P. Joule, Esq.

(Read July 13th, 1847.)

Having recently had occasion to ascertain the specific heat of sperm oil, I employed for the purpose the new method described in the Seventh Volume, New Series, of the Memoirs of this Society. Two platinum wires, each four inches long and $\frac{1}{100}$th of an inch in diameter, were immersed, one in a known quantity of water, and the other in the sperm oil. A powerful current of electricity from six large constant cells, was then transmitted through the wires for half an hour, and the increase of the temperature of the water and oil noted. The specific heat of the sperm oil arrived at was 0.3757, a result so much lower than that of Dalton, that I was led to examine whether I had fallen into any

error. For this purpose, I repeated the experiment, taking however the precaution to keep the liquid constantly agitated. The specific heat now came out 0.406. The cause of the smallness of the result became thus apparent. The oil could not carry off the heat from the wire as quickly as the water, and hence the wire which was immersed in the oil, became highly heated, occasioning an increase in its resistance, and a proportional increase in the quantity of heat evolved by it. This was easily proved, by placing the finger in contact with the wire, which could not be retained in that position longer than one or two seconds.

The object of this communication is therefore to guard the experimenter against employing wires of so small a surface, as those recommended in my paper on specific heat, whenever powerful currents are employed; especially when, at the same time, the specific heat of a viscous liquid of bad conductive power, and small capacity for heat, is sought. In such cases, a large strip of platinum foil would be preferable to a wire, on account of the extensive surface which would thus be presented to the liquid.