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May 26, 1853.

The EARL OF ROSSE, President, in the Chair.

The following communications were read :—

1. A letter from Mr. Joule to Colonel Sabine. Communicated by Col. Sabine, Treas. V.P.R.S. &c.

Acton Square, Salford, May 23, 1853.

MY DEAR SIR,—I notice in the Proceedings of the Royal Society for April 21, a letter from M. Regnault in which some experiments of my own are referred to in a manner which I feel does me injustice. M. Regnault says, “ Le nombre trouvé par M. Joule pour la chaleur spécifique de l’air sous pression constante (0·226) est beaucoup trop faible. Celui qui résulte de mes expériences très nombreuses, et faites dans des circonstances variées, afin de reconnaître et d’éliminer les erreurs constantes, est 0·237.”

Now, in my paper on the air-engine, Phil. Trans. 1852, part i. p. 74, I have given the results of three series of experiments, viz. 0·23008, 0·22674, and 0·2325, and remark, “ The mean of the three results is 0·22977, or nearly 0·23, which we may take as the specific heat of air at constant pressure determined by the above experiments.”

I had been informed that M. Regnault was working on the specific heat of gases, and on that account did not feel it desirable to enter upon the laborious investigation which would have been requisite in order to add a couple of decimal figures to the number I had arrived at, and which was sufficient for the object I had in view, viz. to show that the discrepancy between the actual and theoretical velocity of sound arose from the incorrectness of Delaroché and Berard’s determination of the specific heat of air (2·67), and not from any notable error in my number for the mechanical equivalent of the thermal unit. Having succeeded in doing this, I calculated the Tables 3 and 4 of my paper, using 0·238944 for the specific heat of air under constant pressure. I feel much gratified that the result arrived at by so eminent an experimentalist as M. Regnault confirms the accuracy in the main of the number I adopted.

I have only to add that Professor Thomson and myself, in pursuing our research on the thermal effects of rushing elastic fluids, are following up the views on the relation between mechanical and thermal phenomena originated by ourselves; and we shall feel most happy if M. Regnault’s results, in the important line of investigation he has adopted, will facilitate our labour.

I have the honour to remain, dear Sir,

Yours most truly,

J. P. JOULE.

Colonel Sabine, &c. &c. &c.

2. “ Experimental Researches on Vegetation.” By M. Georges Ville. Communicated by The Earl of Rosse, P.R.S. Received May 26.

After stating that it has often been asked if air, and especially