would, by the use of these Lifts, be carried from the lowest to the highest level of the canal a quantity of water equal to the loads passed down.

Mr. Green stated, in reply to several questions, that in some parts of the canal it had been found impracticable to get a sufficient drain to empty the chamber—they were compelled therefore to use a half lock of 18 inches' fall; that there were seven lifts and one inclined plane on the canal, effecting a rise of 262 feet in eleven miles. That he should not recommend them as applicable to boats of more than 20 or 30 tons. The width of larger boats was an obstacle. They were extremely advantageous for narrow canals; for boats of 50 or 60 feet in length and about 30 tons.

Mr. Parkes remarked, that he considered the question of narrow canals as a most important one—the advantage to be derived from narrow canals was a subject to which sufficient attention had not been paid.

The President called attention to the remark in Mr. Green's paper respecting the quantity of water carried up from one level to another in a downward trade wherever these Lifts are used; then a coal country on high level may supply itself with as much water as it sends down coal. The subject of inclined planes being alluded to, especially those of the Morristown Canal of 200 feet each, where a rise of 1600 feet is effected by eight inclined planes, Mr. G. remarked that more water and time must be expended, the friction and length being much greater. In the Lifts there was only as much water consumed as was equal to the load, but that he should not consider them as practically applicable to more than 60 or 70 feet. Favourable levels with ascents of more than 60 or 70 feet could seldom be found; could he have had the choice of the line in this particular instance, he should have effected by four lifts the rise for which seven are now employed.

Evapora-
tion of
Water.

Some farther observations on the evaporation of water, by Josiah Parkes, were read. The author calls attention to the importance of ascertaining the evaporation of boilers, and of masters having a regular report of the work done, and of the fuel consumed. Attention should also be directed to the settling of the boilers; and their general management. The defects which generally exist are inadequate boiler power, insufficient covering, and absence of good reservoirs. A little attention to these points on the part of respectable engine-makers would lead to definite knowledge, and put an end to the pretensions of the empiric.

The paper is accompanied by a table, shewing the proportionate parts of 112 lbs. of coal burnt in heating water from 32° to 212° with that burnt in evaporating it from 212°. It is constructed on the established principle of the sum of the latent and sensible heat being constant, and is of great use in reducing the results of numerous experiments to one common standard, and ascertaining the value of fuel; and in comparing one set of experiments with another; when the water has been supplied to the boilers at different temperatures.

The evaporation of water as stated by Mr. Manby, in the experiment with Collier's boiler, being reduced to the same standard as others in his paper, it appeared that 20·24 cubic feet were evaporated from 212° F. with 112 lbs. of coal. The quantity evaporated at the Fowey Consols was 21·37 cubic feet.

It appeared on comparing the value of the Locomotive Engine and the Cornish Engine by the quantity of coals consumed, per horse power, they were as 1 to 35.

The difference in the heating effects of coke and coal having been observed, Mr. Parkes remarked that the heat generated depended on the ratio of the rate of absorption of the oxygen; there must be more space betwixt the bars when coke than when coal is consumed, and the quantity of oxygen required is much greater in the former than in the latter case. More air however may be drawn through the bars than can possibly enter into combustion, and the general temperature is lowered in consequence.

Heat of
Coke and
Coal.

The comparative value of coke and coal in melting glass had been observed by Mr. Pellatt, and it appeared that 21 tons of coke produced the same effect as 26 tons of the best coal.

April 3, 1838.

The PRESIDENT in the Chair.

The following were balloted for and elected; C. R. Buckle, as a Graduate; J. Ignatius Massie, as an Associate.

On the Teeth of Wheels. By Robert Willis, Jacksonian Professor of Natural Philosophy in the University of Cambridge.

Teeth of
Wheels.

The geometry of the subject of the teeth of wheels may be con-