of the vessel is about a litre or 1000 cubic centimetres. But since we know that the exhaustion has reduced the density to $\frac{1}{400\frac{1}{0000}}$ of its original, the volume occupied by the residual gas at ordinary pressures would be that of a little bubble $\frac{1}{10}$ of an inch in diameter.

Sir Wm. Thomson, T. Clerk-Maxwell, and Clausius have shown that in a gas, at ordinary pressure, the mean or average path between two collisions is about $\frac{1}{10\frac{1}{000}}$ of a millimetre. When the pressure is reduced to $\frac{1}{400\frac{1}{0000}}$ the mean will be 400 millimetres, or about a foot and a half. What takes place is this. The particles of the gas are flying about in all directions, with a velocity which depends on the temperature. When they impinge on the heated disc their velocity is increased, they go off with a greater velocity than those which go off from the colder side, and hence there is a recoil of the disc. When the gas is at all dense the particles get a very short way before they are met by another and sent back, and so the velocity gets a common velocity before any visible action takes place. When the gas is rare the particles may get a long way off before they meet others, and so the action becomes perceptible.

In case of cooling they go away with diminished velocity and a negative recoil.

The author of the paper went on to show that the total mechanical action on a square centimetre of black surface derived from the radiation of a magnesium lamp, at a distance of 150 mill., did not exceed a continuous pressure of $\frac{1}{60}$ part of a milligramme, and that the total work done did not amount to the five-millionth part of the available energy received by the movable surfaces.

*ADDITION TO OUR KNOWLEDGE OF THE TERMITES**

FRITZ MÜLLER has recently published a short but interesting memoir on the larvæ of Calotermes, a genus of Termites, which he describes with his wonted care and accuracy. We cannot, of course, here follow him in detail; but, as is so often the case in the writings of this eminent naturalist, he draws our attention by his descriptions to several points of unusual interest. As occurs in some other insects, the youngest larvæ of Calotermes differ much in form from those somewhat more advanced in age. The form of the younger larvæ may be accounted for on two hypotheses. It may be an adaptation to the mode of life, or it may be the original larval form of the group. In the latter case, Herr Müller considers that it would be an extremely interesting form, because, in his opinion, Calotermes is one of the oldest, if not the oldest, of existing insect genera; since, according to Hagen, the carboniferous Termites described by Goldenburg from the cold strata belong to this group. Under the latter hypothesis, therefore, the younger larvæ of Calotermes would have, as regards insects, an interest similar to that possessed by Nauplius among Crustacea; and, according to Müller, the latter really is the case. The youngest larvæ of Calotermes live with their elder sisters, in the same localities, on the same food, and, in fact, under precisely the same conditions. These older larvæ have, in a word, completely adapted themselves to their dwelling-place and mode of life. Like most animals which burrow in earth, wood, or stone, they are cylindrical in form. Not so the youngest larvæ, which are flattened, and have the thorax laterally expanded. Their structure is, in Müller's opinion, as unsuitable as possible for animals inhabiting wood. This form is therefore probably only possessed through inheritance from far distant ancestors.

It is unnecessary to point out how great is the interest attaching to these larvæ, if Müller's view be correct; nor would I venture to express any dissent from his conclusions. But, I confess, there seems to me a difficulty in comprehending why the younger larvæ have not adapted themselves to their conditions, in like manner as their elders.

May there not possibly be some circumstances which have hitherto escaped observation, and which might render the form of these larvæ not so altogether unsuitable as Müller supposes?

I will just refer to one other point in this interesting paper. The author shows that the main, if not the whole growth of the antenna takes place in the third segment: the two basal ones and the terminal portion remaining almost unaltered. My husband, many years ago (Linn. Trans., 1863), showed this to be the case in the Ephemera (*Chloeön*), and it would be interesting to know whether the same thing occurs among other Neuroptera.

High Elms ELLEN LUBBOCK

* By Fritz Müller.

NOTES

THE Loan Exhibition of Scientific Apparatus at South Kensington, to which we have already referred (vol. xi. p. 301), will open on the 1st of April, 1876, and remain open until the end of September, after which time the objects will be returned to the owners. It will, as we have already intimated, consist of instruments and apparatus employed for research, and other scientific purposes, and for teaching. It will also include apparatus illustrative of the progress of science, and its application to the arts, as well as such as may possess special interest on account of the persons by whom, or the investigations in which, it had been employed. The precise limits are detailed under several sections in a syllabus which has been issued for the information of exhibitors. Models, drawings, or photographs will also be admissible where the originals cannot be sent. The apparatus may, in certain cases, be arranged in train as used for typical investigations; and arrangements will be made, as far as it may be found practicable, for systematically explaining and illustrating the use of the apparatus in the various sections. Forms on which to enter descriptions of objects offered for exhibition may be obtained on application to the Director of the South Kensington Museum, London, S.W. These forms should be filled up and returned as soon as possible, so that exhibitors may receive early intimation as to the admissibility of the objects they propose to send. The cost of carriage of all objects selected for exhibition will be defrayed by the Science and Art Department. It is hoped that institutions or individuals having instruments of historic interest will be good enough to lend them. The following are the various sections into which the Exhibition will be divided:—Arithmetic, Geometry, Measurement, Kinematics, Statics and Dynamics, Molecular Physics, Sound, Light, Heat, Magnetism, Electricity, Astronomy, Applied Mechanics—[as the Exhibition must be regarded as chiefly referring to education, research, and other scientific purposes, it must in this division consist principally of models, diagrams, mechanical drawings, and small machines, illustrative of the principles and progress of mechanical science, and of the application of mechanics to the arts],—Chemistry Meteorology, Geography, Geology and Mining, Mineralogy, Crystallography, and Biology.

MR. SULLIVAN on Tuesday, in the House of Commons, moved with regard to the necessity for having a Museum of Science and Art in Dublin. He, as well as the other speakers, seems to be ignorant of the fact that in addition to its educational staff and appliances, the Royal College of Science in Dublin possesses the germ of an admirable museum which formerly constituted the Museum of Irish Industry. It seems probable that what is needed is a removal of the specimens from the College to a suitable building; probably an enlargement of the Royal Dublin Society would be best, and the space thus gained in the College of cience