actual conformations of the great terrestrial divisions of land and sea, arcs of longitude are, I imagine, especially likely to be affected by such causes.

The views which I have now attempted to express are by no means new, but it has not appeared necessary to cite authorities. I am indebted to many writers, but I should be sorry to have to assign to each the measure of the influence which his learning has had on the drawing up of this brief, which I hope some geodesist will now take up and argue more fully and more ably.

Dehra J. HERSCHEL

THE ROYAL SOCIETY SOIRÉE

ON Wednesday last week the President of the Royal Society gave a *soirée* at Burlington House, which was largely attended, and at which a considerable variety of apparatus were exhibited and many experiments made. Mr. Crookes showed his exhausted tubes and other apparatus, illustrating various phenomena connected with molecular physics in high vacua. The experiments made by these were the following:—

1. *Dark Space round the Negative Pole.*—When the spark from an induction coil is passed through an ordinary vacuum tube, a dark space is seen round the negative pole. The shape and size of this dark space do not vary with the distance separating the poles; nor, only very slightly, with alteration of battery power, or with intensity of spark. This well-known dark space appears to be a layer of molecular disturbance identical with the invisible layer of molecular pressure or stress, the investigation of which has occupied the exhibitor some years.

2. *The Electrical Radiometer.*—An ordinary radiometer is furnished with aluminium cups for vanes. The fly is supported by a hard steel cup, and the needle point on which it works is connected with a platinum terminal sealed into the glass. At the top of the radiometer bulb a second terminal is sealed in; the radiometer can therefore be connected with an induction coil, the movable fly being made the negative pole. At low exhaustions a velvety violet halo forms over each side of the cup. On increasing the exhaustion the dark space widens out, retaining almost exactly the shape of the cup; the bright margin of the dark space becomes concentrated at the concave side of the cup to a luminous focus, and widens out at the convex side. On further exhaustion, the dark space on the convex side touches the glass, when positive rotation takes place.

3. *Green Phosphorescent Light of Molecular Impact.*—At very high exhaustions the dark space becomes so large that it fills the tube, and when German glass is used the sides are beautifully illuminated with a greenish yellow phosphorescent light.

4. *Projection of Molecular Shadows.*—The rays exciting this green phosphoresence will not turn a corner in the slightest degree, but radiate from the negative pole in straight lines, casting strong and sharply-defined shadows from objects which happen to be in their path. The best and sharpest shadows are cast by flat disks, and not by narrow pointed poles; no green light is seen in the shadow itself, no matter how thin, or whatever may be the substance from which it is thrown.

5. *Magnetic Deflection of the Trajectory of Molecules.*—The stream of molecules, whose impact on the glass is accompanied by evolution of light, is very sensitive to magnetic influence, and the shadow can be deflected by bringing a small permament magnet near, the amount of deflection of the stream of molecules being in proportion to the magnetic power employed. The trajectory of the molecules forming the shadow is curved when under magnetic influence.

6. *Focus of Heat of Molecular Impact.*—Great heat is evolved when the concentrated focus of molecular rays from a nearly hemispherical aluminium cup is allowed to fall on a strip of platinum-foil, the heat sometimes exceeding the melting-point of platinum.

7. *Mechanical Action of Projected Molecules.*—An actual material blow is given by the impinging molecules. A small vaned wheel being used as an indicator, by appropriate means the molecular shadow of an aluminium plate is projected on the vanes. When entirely in the shadow the indicator does not move, but when the molecular stream is deflected so that one-half of the wheel is exposed to molecular impact it rotates with extreme velocity.

8. *Phosphorogenic Properties of the Molecular Stream.*—Substances known to be phosphorescent under ordinary circumstances shine with great splendour when subjected to the negative discharge in a high vacuum. (*a.*) *Becquerel's Luminous Sulphide of Calcium* shines with a bright blue-violet light, and when on a surface of several square inches, is sufficient to faintly light a room. (*b.*) *The Diamond* is very phophorescent. Most diamonds from South Africa phosphoresce with a blue light. Diamonds from other localities shine with different colours, such as bright blue, apricot, pale blue, red, yellowish green, orange, and pale green. One large fluorescent diamond gives almost as much light as a candle when phosphorescing in a good vacuum. (*c.*) *The Ruby* glows with a rich full red, and it is of little consequence what degree of colour the stone possesses naturally, the colour of the phosphorescence is nearly the same in all cases.

Besides these experiments the working of the writing telegraph, exhibited by Mr. E. A. Cowper, attracted much interest. The nature of this invention we described when it was first announced, and gave a specimen of the kind of writing produced. Other exhibits deserving notice were Prof. Guthrie's broken glass in frames, illustrating the fracture of colloids, Edison's loud-speaking telephone, Messrs. Preece and Stroh's synthetic curve machine, and frame of curves produced thereby; their automatic phonograph, electromagnetic vowel-sounder, stereoscopic curves, synthetic sounder and syren, and phonautograph. Apparatus and instruments of various kinds were also exhibited by Messrs. Browning, Hilger, and Tisley and Co. Among Mr. Hilger's exhibits was a quartz spectroscope for the ultra-violet rays, constructed for the Scientific Society of Stettin, under the direction of Dr. Schönn.

A NEW CALENDAR CLOCK

IT has always been a matter of surprise that the Americans can produce their well-known eight-day clocks in such large quantities, so uniformly good for ordinary purposes, and at such very moderate cost. Their general efficiency is proved by the increasing demand for them; not only are they sold in the American made cases, but separate movements are extensively imported and cased in England. One of the largest firms by which they are produced, that of Seth Thomas and Co., at Thomaston, Conn., has recently introduced a library or office clock of very moderate cost, one form of which is shown in the accompanying figure. This consists of the ordinary eight-day striking movement supplemented by an interesting and ingenious mechanism for operating the calendar; by its means not only the month and day of the week and month are indicated as in ordinary calendars, but the several months have their allotted number of days, an additional day being given to February in leap-year. Of course contrivances for effecting this object have long been known, but they always add so materially to the cost that they are prevented from coming into general use.

It would be impossible to fully explain the mechanism employed without the aid of drawings; a general description must therefore suffice. As will be seen, the calendar dial is placed below the clock dial, and is divided on its