

then be collected, like the heavy powders in air, at the nodal lines. In a denser medium, such as water, the reverse should happen ; the heavy powders should be carried along by the more powerful currents then produced, and would accumulate in the vibrating parts. All these conclusions were found to be fully verified by actual experiment.

May 19.

JOHN W. LUBBOCK, Esq. M.A., V. P. & Treasurer, in the Chair.

The following Presents were received, and thanks ordered for them :—

The Astronomical Remembrancer. Proposed by Captain W. H. Smyth, R.N., F.R.S. : exhibiting the Magnitude, Declination, Right Ascension, and Passage in mean time over the Meridian, of one Hundred of the Principal Fixed Stars.—*Presented by G. Dollond, Esq., F.R.S.*

A Narrative of a Visit to the Court of Sinde ; a Sketch of the History of Cutch, from its first connection with the British Government in India till the conclusion of the Treaty of 1819 ; and some Remarks on the Medical Topography of Bhooj. By James Burnes, Esq. 8vo.—*The Author ; through Joseph Hume, Esq. F.R.S.*

Catalogue of the Library of the Royal College of Surgeons in London. 8vo.—*The College.*

Catalogue of the Contents of the Museum of the Royal College of Surgeons in London. Part III. : comprehending the Human and Comparative Osteology. 4to.—*The College.*

A Cast from the Marble Bust of Michael Faraday, Esq. F.R.S. executed by E. H. Bailey, R.A.—*Richard Hollier, Esq.*

A Portrait of Michael Faraday, Esq. F.R.S. engraved by Cousins from the Painting by Pickersgill.—*Messrs. Colnaghi and Son.*

A paper was read, entitled, “ A Table facilitating the Computations relative to Suspension Bridges.” By Davies Gilbert, Esq. V.P.R.S.

The table here communicated is supplementary to those accompanying the paper “ On the Mathematical Theory of Suspension Bridges,” which was published in the Philosophical Transactions for 1826, and is deduced from the first of the tables there given ; but admits of a far more ready application than the former to all cases of practical investigation. It consists of five columns, exhibiting respectively the deflections or versed sines of the curve ; the lengths of the chains ; the tension at the middle points, or apices of the curve ; the tensions at the extremities ; and the angles made by the chains with the horizon at the extremities.

A paper was read, entitled, “ Researches in Physical Astro-

nomy." By J. W. Lubbock, Esq. V.P. and Treasurer of the Royal Society.

The first part of this paper relates to the theory of the moon. The method of solution pursued by Clairaut consisted in the integration of differential equations, in which the true longitude of the moon is the independent variable: the time is then obtained in terms of the true longitude; and by the reversion of series, the longitude afterwards obtained in terms of the time. This method is the one adopted by Mayer, Laplace, and Damoiseau. The author has been led, by reflecting on the difficulties of this problem, to believe that the integration of the differential equations in which the time is the independent variable would be at least as easy as the former process; and it would possess the advantage of employing the same system of equations for the moon as for the planets. The lunar theory proposed by the author, and developed in this paper, is an extension of the equations given in his former *Researches in Physical Astronomy*, already published in the *Philosophical Transactions*; by including those terms, which, in consequence of the great eccentricity of the moon's orbit, are sensible; and by suppressing those which are insensible from the great distance of the sun, the disturbing body. He has not yet attempted to obtain numerical results, but proposes at some future time to engage in their computation.

In the second part of the paper, he investigates the precession of the equinoxes, on the supposition that the earth revolves in a resisting medium; an investigation which may also be considered as a sequel to the author's last paper on *Physical Astronomy*. The effects of the resistance of such a medium is to increase the latitude of the axis of rotation (reckoned from the equator of the figure) till it reaches 90° . Such is now the condition of the axis of the earth: but as the chances are infinitely great against this having been its original position, may not its attainment of this position be ascribed to the resistance of a medium of small density acting for a great length of time,—a supposition which may account for many geological indications of changes having taken place in the climates of the earth? The operation of such a cause would be also sensible in the case of comets: and the accuracy with which the eccentricity of the Halleian comet of 1759 is known, would appear to afford a favourable opportunity of verifying this hypothesis.

A paper was read, entitled, "An Account of the Construction and Verification of the Imperial Standard Yard for the Royal Society." By Captain Henry Kater, F.R.S.

The scale of the standard, of which an account is given in this paper, is constructed in a manner described in the *Philosophical Transactions* for 1830. The support is of brass 40 inches long, 17.5 inches wide, and 0.6 of an inch in thickness. A brass plate seven-hundredths of an inch thick was made to slide freely upon the support in a dove-tail groove formed by two side plates, and was then fixed to the support by a screw passing through its middle.