

In conclusion, the author remarks, that induction appears to be essentially an action of contiguous particles, through the intermediation of which the electric force originating or appearing at a certain place, is propagated to or sustained at a distance, appearing there as a force of the same kind and exactly equal in amount, but opposite in its direction and tendencies. Induction requires no sensible thickness in the conductors which may be used to limit its extent, for an uninsulated leaf of gold may be made very highly positive on one surface, and as highly negative on the other, without the least interference of the two states, as long as the induction continues. But with regard to dielectrics, or insulating media, the results are very different; for their thickness has an immediate and important influence on the degree of induction. As to their quality, though all gases and vapours are alike, whatever be their state, amongst solid bodies, and between them and gases, there are differences which prove the existence of specific inductive capacities.

The author also refers to a transverse force with which the direct inductive force is accompanied. The experimental proof of the existence of such a force, in all cases of induction, is, from its bearing on the phenomena of electro-magnetism and magneto-electricity, of the highest importance; and we cannot but look forward with the greatest interest to the promised communication in which these and other phenomena relating to this subject will be reviewed.

January 18, 1838.

FRANCIS BAILY, Esq., Vice-President and Treasurer,
in the Chair.

Bryan Donkin, Esq.; Sir John Jacob Hansler; the Rev. George Henry Sacheverell Johnson, M.A.; and George Richardson Porter, Esq., were severally elected Fellows of the Society.

“On the Variation of a Triple Integral.” By Richard Abbott, Esq. F.R.A.S. Communicated by Benjamin Gompertz, Esq., F.R.S.

In the calculus of variations, the discovery of which has immortalized the name of Lagrange, that illustrious mathematician, by differentiating the function with respect to a new variable which enters into it, reduced the general problem of indeterminate maxima and minima to the solution of an equation depending on the variation of the given integral, whether single or multiple, and whose differential coefficient contains any number of variables, or which even depends on other integrals. The author investigates, in the present memoir, the case in which the given function is a triple integral; its variation being composed of two distinct parts, namely, a triple integral and another part, the determination of which must be sought from the limits of the triple integral.

“Explanation of the Phenomena of Intermitting Springs.” By

W. L. Wharton, Esq. Communicated by James F. W. Johnston, Esq., M.A., F.R.S. L. & Ed.

The author, considering the generally received explanation of intermitting springs, founded on the operation of a simple syphon, as being insufficient to account for the phenomena, inasmuch as the water which has risen above the lower side of the bend of the syphon will merely trickle down its longer leg, and be expended before it can fill the whole area of that part of the syphon, has proposed the following hypothesis for the solution of the difficulty. He conceives that the stream, while falling obliquely down the long leg of the syphon, is broken into drops, and carries along with it numerous air-bubbles, which, if the lower end of the tube have an abrupt bend upwards, will be impelled forwards, and escape at the open part; thus occasioning a rarefaction of the remaining air in the tube sufficient to ensure its full operation as a syphon. A model is described, which the author constructed for the purpose of illustrating and corroborating his views.

January 25, 1838.

FRANCIS BAILY, Esq., Vice-President and Treasurer,
in the Chair.

Neil Arnott, M.D.; the Rev. William Cureton, M.A.; and Charles Lock Eastlake, Esq., were severally elected Fellows of the Society.

A paper was in part read, entitled, "Fourth Letter on Voltaic Combinations." Addressed to Michael Faraday, Esq., D.C.L., F.R.S., by John Frederic Daniell, Esq., F.R.S.

February 1, 1838.

FRANCIS BAILY, Esq., Vice-President and Treasurer,
in the Chair.

The reading of a paper, entitled "Fourth Letter on Voltaic Combinations, with reference to the mutual relations of the generating and conducting surfaces;" addressed to Michael Faraday, Esq., D.C.L., F.R.S., &c. By John Frederic Daniell, Esq., F.R.S., Professor of Chemistry in King's College, London, was resumed and concluded.

In this communication the author describes a series of experiments, made for the purpose of determining the distribution of the voltaic force from its source in the generating metal, as indicated by the deposition of reduced copper in the constant battery; and, considering that the voltaic combination most perfect in theory would be one formed by a solid sphere, or point, of the generating metal, surrounded by a hollow sphere of the conducting metal, with an intervening liquid electrolyte, he constructed an apparatus making as near an approximation as possible to these conditions. It consisted of two hollow brass hemispheres, applied to each other by exterior