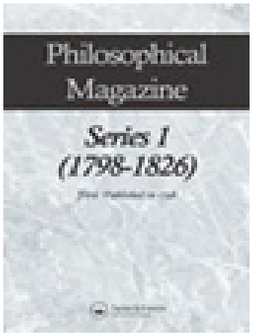

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III. Description of a mercurial Voltaic conductor

W.H. Pepys Esq. F.R.S.

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III. *Description of a Mercurial Voltaic Conductor.* By W. H. Pepys, *Esq. F.R.S.**

The advantages obtained by perfect contact in Voltaic conductors is well known to the experimentalist, particularly when the combinations or series of plates are but few. Hence the slightest oxidation or corrosion of the wires destroys more than half the effect.

Having with others noticed the complete contact which quicksilver gives, I had an apparatus so constructed as to unite this advantage with the facility of using the wires or conductors in almost all the modifications that are required in the valuable and interesting experiments of Sir H. Davy on the electrical laws of chemical decomposition.

This apparatus has also another claim to notice, from the operator not being so likely to receive the charge, when the combinations are extensive, the adjusting-sliders being non-conductors of electricity.

With this apparatus and a series of six troughs of ten four-inch plates, I have decompounded solutions of the neutral and several of the more solid salts, such as gypsum, chalk, and fluor spar; deflagrated charcoal, phosphorus, and the metals; and formed the alloys of sodium, potassium, and ammonium with mercury.

Reference to Plate I.

Transparent View of the Apparatus, showing the Inside Arrangements of the Box.

A and B. Two cells formed by a partition of glass at C. They are to be filled about a third with quicksilver.

D and E. The negative and positive conducting wires from the Voltaic battery entering the quicksilver in the cells.

F and G. Two tubes of glass filled with quicksilver, with platina wires cemented into their lower ends, attached to sliders in the top of the box, and moving freely in the cells of quicksilver beneath.

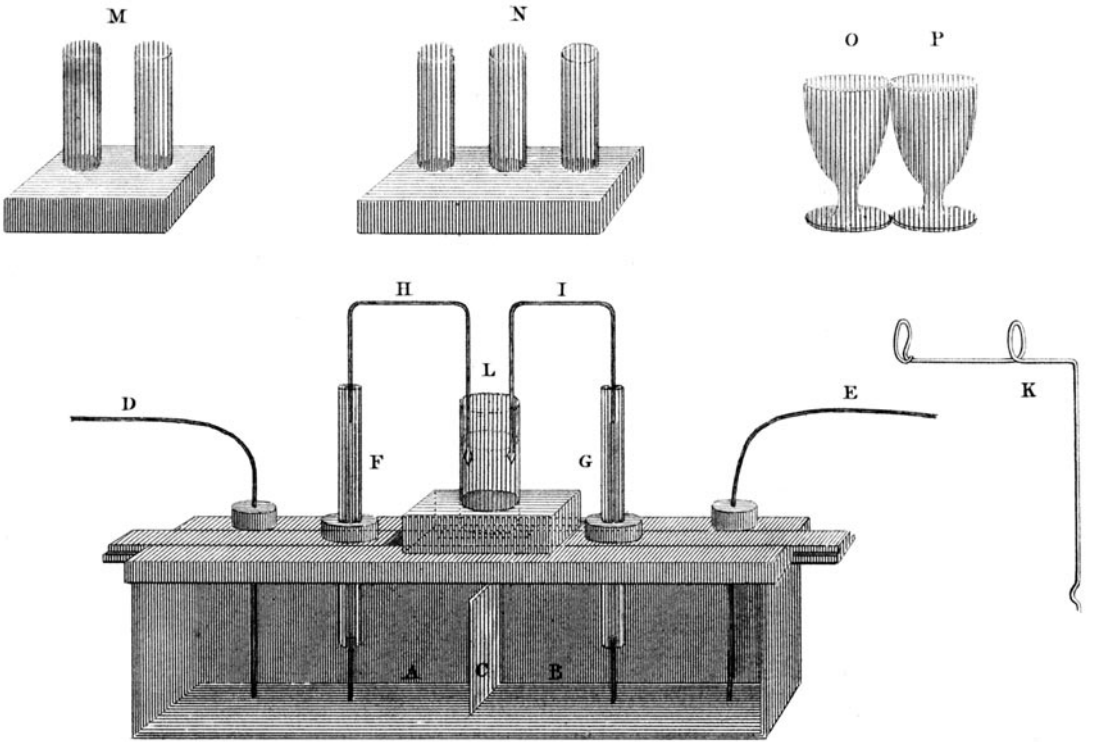
H and I. Two moveable platina wires entering the glass tubes in contact with the mercury. These wires are variously formed at the will of the operator: those shown in the apparatus are pointed at one end, and being slightly bent at the other may be adjusted to any heights in the quicksilver of the tubes.

K. Platina crayon-holder for receiving slips of charcoal or rolls of metallic leaf for deflagration.

L, M, and N. Series of one, two, and three vessels (in

* Communicated by Mr. Pepys.

stands



S. Porter sc.

stands for their security) for holding solutions, &c. exposed to the Voltaic conductor. The communications where more than one is used are made by asbestos, &c.

O and P. Vases or cups turned in gypsum, chalk, or fluor spar, and filled with water or coloured solutions, for the purpose of exhibiting the decomposition of such bodies, as before mentioned.

The apparatus and its appendages were constructed under my direction by Mr. Bate, philosophical instrument-maker, Poultry, London.

IV. *On the Difference between the Hydro-carbonated Gases extricated from Mineral and Animal Substances respectively*.*

MESSRS. THENARD and DUPUYTREN, within these two or three years, made an experiment which has thrown considerable light on the existence of miasmata. They agitated distilled water with hydro-carbonated gas extricated from mineral substances. This water, exposed to the air and allowed to stand, was not disturbed, and gradually got rid of its hydrogen gas without being corrupted. The same experiment made with hydro-carbonated gas coming from animal putrefaction presented another result. The water became turbid, it contained flakes of a substance truly animal, which was precipitated on being allowed to rest, and the liquid was putrefied. Thus, although the gas was the same to the eyes of the experimenter, the latter contained manifestly miasmata which gave rise to the flakes observed, and to the putrefaction of the water.

M. Moscati, an eminent Italian physician, has made similar and equally interesting experiments. Having observed that the cultivation of rice in the humid rice grounds of Tuscany was annually attended with epidemic diseases and adynamic fevers, he conceived the idea of ascertaining the nature of the vapours which rose from the ground where rice was cultivated: with this view he suspended at some distance from the ground hollow spheres filled with ice. The vapours were condensed on the spheres in the form of hoar frost. He collected this substance in flasks, in which it melted and at first presented a clear liquid. Speedily it was filled with small flakes, which when collected and ana-

* *Annales de Chimie*, tome lxxxii. p. 330.

lysed,