

February 2, 1837.

FRANCIS BAILY, Esq., V.P. and Treasurer, in the Chair.

“Observations on the Electro-chemical Influence of long-continued Electric Currents of Low Tension.” By G. Golding Bird, Esq., F.L.S., F.G.S., Lecturer on Experimental Philosophy at Guy’s Hospital. Communicated by Thomas Bell, Esq., F.R.S.

The author, after observing that the brilliant discoveries in electro-chemistry obtained by Sir Humphry Davy were effected by the employment of voltaic currents of high intensity, elicited by means of large batteries, adverts to the labours of M. Becquerel, to whom we are indebted for the knowledge of the chemical agency of feeble currents in reducing several refractory oxides to the metallic state : and also to those of Dr. E. Davy, Bucholtz, and Professor Faraday in effecting decompositions of other substances by similar means. In prosecuting this branch of inquiry, the author employed an apparatus analogous to that of Professor Daniell, for obtaining an equal and continuous current of low intensity from a single pair of plates : the metallic solution, in which a copper-plate was immersed, being contained in a glass tube, closed at the bottom by a diaphragm of plaster of Paris, and itself plunged in a weak solution of brine contained in a larger vessel, in which a plate of zinc was immersed ; and a communication being established between the two metallic plates by connecting wires. By the feeble, but continuous current thus elicited, sulphate of copper is found to be slowly decomposed, affording beautiful crystals of metallic copper. Iron, tin, zinc, bismuth, antimony, lead, and silver may, in like manner, be reduced, by a similar and slightly modified process ; in general appearing with metallic lustre, and in a crystalline form, and presenting a remarkable contrast in their appearance to the irregular, soft, and spongy masses obtained from the same solutions by means of large batteries. The crystals of copper rival in hardness and malleability the finest specimens of native copper, which they much resemble in appearance. The crystallization of bismuth, lead, and silver, by this process, is very beautiful ; that of bismuth being lamellar, of a lustre approaching to that of iron, but with the reddish tint peculiar to the former metal. Silver may thus be procured of the whiteness of snow, and usually in the form of needles. Some metals, such as nickel, which, when acted on by currents from large batteries, are deposited from their solutions as oxides only, are obtained, by means of the apparatus used by the author, in a brilliant metallic form. He farther found that he could in this way reduce even the more refractory metallic oxides, such as silica, which resist the action of powerful batteries, and which M. Becquerel could only obtain in alloy with iron. By a slight modification of the apparatus he was enabled to form amalgams both of potassium and of sodium with mercury, by the decomposition of solutions of chlorides of those bases ; and in like manner ammonium was easily reduced, when in contact with mercury, by the influence of a feeble voltaic current. In this last

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experiment it was found that an interruption to the continuance of the current, even for a few seconds, is sufficient to destroy the whole of the product which had been the result of the previous long-continued action ; the spongy ammoniacal amalgam being instantly decomposed, and the ammonia formed being dissolved in the surrounding fluid.

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February 9, 1837.

FRANCIS BAILY, Esq., V. P. and Treasurer, in the Chair.

Edmund Halswell, Esq., who, at the last Anniversary, had ceased to be a Fellow, from the non-payment of his annual contribution, was, at this meeting, readmitted by ballot into the Society, agreeably to the provision of the statutes.

A paper was read, in part, entitled, "On the Elementary Structure of Muscular Fibre of Animal and Organic Life." By Frederick Skey, Esq., Assistant Surgeon to St. Bartholomew's Hospital. Communicated by John Bostock, M.D., F.R.S.

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February 16, 1837.

The Right Honourable the EARL OF BURLINGTON, V.P., in the Chair.

The reading of a paper entitled, "On the Elementary Structure of Muscular Fibre of Animal and Organic Life." By Frederick Skey, Esq., Assistant Surgeon to St. Bartholomew's Hospital. Communicated by John Bostock, M.D., F.R.S., was resumed and concluded.

The author concludes, from his microscopic examinations of the structure of muscular fibres, that those subservient to the functions of animal life have, in man, an average diameter of one 400th of an inch, and are surrounded by transverse circular striæ varying in thickness, and in the number contained in a given space. He describes these striæ as constituted by actual elevations on the surface of the fibre, with intermediate depressions, considerably narrower than the diameter of a globule of the blood. Each of these muscular fibres, of which the diameter is one 400th of an inch, is divisible into bands or fibrillæ, each of which is again subdivisible into about one hundred tubular filaments, arranged parallel to one another, in a longitudinal direction, around the axis of the tubular fibre which they compose, and which contains in its centre a soluble gluten. The partial separation of the fibrillæ gives rise to the appearance of broken or interrupted circular striæ, which are occasionally seen. The diameter of each filament is one 16,000th of an inch, or about a third part of that of a globule of the blood. On the other hand, the muscles of organic life are composed, not of fibres similar to those above described, but of filaments only ; these filaments being interwoven with each other in irregularly disposed lines of various thickness ; having for the most part a longitudinal direction, but forming a kind of untraceable network. They are readily distinguishable from tendinous fibres, by the