

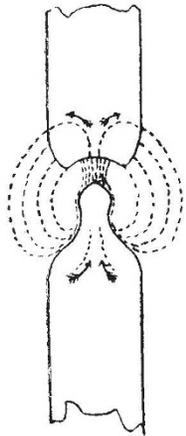
HIGH PRESSURE ELECTRICITY.¹

THIS book is not a mere ordinary *édition de luxe*, for it is probably the most sumptuous book in connection with electricity that has ever appeared. The life-like vividness of forty-one beautifully executed photographic reproductions of electric brushes and streamers make you hear the banging of the battery of many "ten-gallon" Leyden jars; while the description of these illustrations, from the largeness of the type used, the wide spacing of the lines, the two- to three-inch margin that surrounds them, and the blank page that intervenes between every two pages of printed matter, induces a feeling of luxury in the reader, and makes him hope that the theoretical inferences will be as good as the very thick paper on which they are printed.

Lord Armstrong starts with the very striking experiment which he performed with his hydro-electric machine half a century ago. Two glasses of distilled water were placed near together, and a thread of cotton, which was coiled up in the one, had its end placed so as to dip into the other glass. Then on highly electrifying the glass of water in which the cotton was coiled negatively, and the other glass of water positively, the thread crept out of its glass into the other one, while a stream of water passed in the opposite direction.

From this he has been led to conclude that an electric current consists of two streams—a negative one in the form of a core flowing in one direction surrounded by a sort of sleeve of positive electricity flowing in the opposite direction; and he suggests, on page 24, that instead of negative and positive the names "Inward" and "Outward" would better meet his views.

He cites as an illustration of his theory the formation of the crater at the end of the positive carbon of an electric arc, and the knob at the end of the negative carbon; both of which he considers are produced by the scooping out effected by the "lines of force," which he considers follow some such path as that indicated on the accompanying figure copied from the book.



There are various reasons, however, with which Lord Armstrong is apparently unacquainted, for believing that the scooping-out theory is not correct; for example, when a thin carbon rod is put endways into an arc the rod is simply pointed like a pencil, with no appearance of any directed scooping action. Whereas, if Lord Armstrong's "lines of force" were correct, we should expect to find a cavity scooped out on one side of the carbon rod near the middle

of the arc, and another on the other side near the edge. But this only happens when the carbon rod is wide, and is placed so as to split up the arc into two *distinct* arcs.

Some of the illustrations are photographic reproductions of dust figures obtained with brush discharges, while others of them were produced by causing a violent discharge from a large battery of Leyden jars to take place from a metallic disc resting on an insulated photographic plate, the disc being in some experiments positive, in others negative. In other cases two photographic plates were placed back to back with the sensitive sides outwards, and the positive and negative electrodes were placed against the two sensitised surfaces respectively.

The figure formed at the negative electrode was found to be smaller than that produced at the other, and in answer to the question "How can this be reconciled with

the assumption that negative and positive action are equal?" the author remarks on page 26:—

"The answer is obvious if we admit that the negative represents suction, and the positive pressure, because in that case the negative flow will be resisted by condensation, while the positive will be helped."

And on page 44 he suggests, as a possible hypothesis, that as in a pump,

"The negative stroke, representing suction, must take the lead of the positive, and will have to draw from a neutral atmosphere. In doing so it will create a deficit in the environment which will aid inductively the impulsive energy of the positive."

On page 49 are described experiments in which negative streams were projected from an annular electrode upon a dust plate with a positive metallic ring beneath, and the author, in reference to the dust figures produced, remarks:—

"Their general appearance is strikingly like pictures of physiological cells; and what is more strange, we see them in every state of fission, from small beginnings to complete separation, and in every case the divided form displays the same internal structure as the original form from which it springs. I have already spoken of electricity as organised motion, and we have here an example of it carried to the very verge of life."

All this is probably intended only as a poetic fancy, but it reads strangely in close juxtaposition with a discussion on matter and motion, ether and atoms.

But, whatever may be the opinion of the theoretical portion of this book, whether we consider that the inward flow of negative electricity and the outward flow of positive are supported by the experiments, there can be no doubt that the illustrations form a series of valuable records of electric discharges. W. E. A.

THE REV. P. B. BRODIE, M.A., F.G.S.

IN the death of the Rev. P. B. Brodie geological science has lost one of its oldest cultivators, one who so long ago as 1834 was elected a Fellow of the Geological Society, and who was widely known for his researches on the fossil insects of the Secondary formations of England.

Mr. Brodie, who was born in 1815, was the son of an eminent lawyer, and nephew of the distinguished surgeon Sir Benjamin C. Brodie, Bart. He was educated at Emmanuel College, Cambridge, and coming under the influence of Sedgwick, a taste which he had previously manifested for geology was developed into a life-long enthusiasm for the science.

Entering the Church in 1838, the duties of his calling took him as Curate to Wylke, in Wiltshire, and for a short time to Steeple Claydon, in Buckinghamshire. Later on he became Rector of Down Hatherley, in Gloucestershire, and finally Vicar of Rowington, in Warwickshire. In all these districts he found that a rich harvest of geological facts could be gathered.

His earliest observations were on the Purbeck strata of the Vale of Wardour, and he then discovered many insect-remains, and also the Isopod which was named, by Milne-Edwards, *Archæoniscus Brodiei*. Continuing his researches in the Vale of Gloucester, on the Lias and Lower Oolites, he soon found many unrecorded fossils, and notably many remains of insects, and he thus came to publish, in 1845, his well-known "History of the Fossil Insects in the Secondary Rocks of England." An active member, for a time, of the Cotteswold Naturalists' Field Club, Mr. Brodie was later on a staunch supporter of the Warwickshire Natural History and Archæological Society, and a founder of the Warwickshire Naturalists' and Archæologists' Field Club. He was the life and soul of field-meetings, full

¹ "Electric Movement on Air and Water, with Theoretical Inferences." By Lord Armstrong, C.B., F.R.S. Pp. vii + 55, and plates. (London: Smith, Elder and Co., 1897.)

of energy and high spirits; and at the time of his death he was President of both Warwickshire societies.

Mr. Brodie was the author of many geological papers communicated to the Geological Society, the British Association, and various scientific journals. In 1887 the Council of the Geological Society awarded to Mr. Brodie the Murchison Medal for his long and valuable geological labours; an agreeable testimony to good work achieved by one who, all his life, was a dweller in the provinces.

H. B. W.

NOTES.

THE Royal Society's medals have this year been adjudicated by the President and Council as follows:—The Copley Medal to Prof. Albert von Kölliker, Foreign Member R.S.; a Royal Medal to Prof. Andrew Russell Forsyth, F.R.S.; a Royal Medal to Lieut.-General Sir Richard Strachey, F.R.S.; the Davy Medal to Dr. John Hall Gladstone, F.R.S.; the Buchanan Medal to Sir John Simon, F.R.S. Her Majesty has signified her approval of the award of the Royal Medals.

THE following is a list of those who have been recommended by the President and Council of the Royal Society for election into the Council for the year 1898 at the anniversary meeting on November 30:—President: Lord Lister. Treasurer: Sir John Evans, K.C.B. Secretaries: Prof. Michael Foster, Prof. Arthur William Rücker. Foreign Secretary: Sir Edward Frankland, K.C.B. Other Members of the Council (the names of new Members are printed in italics): Prof. William Grylls Adams, Prof. Thomas Clifford Allbutt, *Sir Robert Stawell Ball, Rev. Thomas George Bonney, Prof. John Cleland, Prof. Robert Bellamy Clifton, Prof. James Alfred Ewing, Alfred Bray Kempe, John Newport Langley, Joseph Larmor, Prof. Nevil Story Maskelyne, Prof. Raphael Meldola, Prof. Edward Bagnall Poulton, William James Russell, Dukinfield Henry Scott, Prof. Walter Frank Raphael Weldon.*

WE learn from the *Times*, with regret, that in consequence of the heavy demands on his time in connection with his duties at the Natural History Museum, Sir William Flower, acting on medical advice, has reluctantly resigned the presidency of the International Congress of Zoology, which is to meet at Cambridge on August 23, 1898. Sir John Lubbock, on the unanimous invitation of the General Committee, has accepted the office, and will accordingly preside over the Congress.

WE announce with great regret the death, on October 31, of Prof. Haughton, of Trinity College, Dublin. We hope in a subsequent number to publish an obituary notice of Prof. Haughton.

It is with much regret that we record the death of Herr Geheimrath Prof. Ernst Schering, of Göttingen, who passed away at Göttingen on November 2, at the age of sixty-four, after a long illness. Schering, besides being professor of mathematics at the University, was director of the Magnetic Department of the Observatory, the seat of Gauss' monumental researches in this branch of science.

THE Queen has conferred the Jubilee Medal upon Prof. W. R. Smith, the President of the Royal Institute of Public Health; Sir George Duffey, President of the Royal College of Physicians, Ireland; Sir William Thomson, President of the Royal College of Surgeons, Ireland; and Mr. Walter Hills, President of the Pharmaceutical Society of Great Britain.

PROF. A. A. MICHELSON, of the University of Chicago, has been elected a member of the International Committee of Weights and Measures, in the place of the late Dr. B. A. Gould.

PROF. HENRY S. PRITCHETT, of Washington University, St. Louis, has been appointed superintendent of the U.S. Coast and Geodetic Survey, as successor to General Duffield.

MR. EDGAR WORTHINGTON has been elected secretary of the Institution of Mechanical Engineers, in the place of Mr. Alfred Bache, who has retired on account of ill-health.

SIR WILLIAM GOWERS is to be entertained at dinner by the Society of Medical Phonographers on November 25. The dinner, over which Sir William Broadbent will preside, is to take place at Limmer's Hotel, and has been arranged for the purpose of congratulating Sir W. Gowers upon his honour of knighthood.

THE members of the Gerlache Antarctic expedition were entertained at Rio de Janeiro by President Moraes, and left on October 28 for Buenos Ayres, *en route* to the Antarctic region.

ON the day of his arrival in New York, Dr. Nansen was the guest of the American Geographical Society, which elected him an honorary member and conferred upon him the Cullum Geographical Medal. He was subsequently the recipient of receptions by the Swedish and Norwegian inhabitants of the city, and the National Geographical Society, Washington, and read a paper on "Some of the Scientific Results of Recent Arctic Explorations" before a special meeting of the American Philosophical Society of Philadelphia. He delivered his first public lecture at New York on November 6.

A REUTER telegram from Rome states that for some days past Vesuvius has been in active eruption, and large quantities of lava have been pouring from the crater called Atrio del Cavallo, which was opened in 1895. The lava has divided into two large streams flowing towards Vitruva and the country north of Piano del Triste respectively, the latter current having again divided into two. The central crater is also distinctly active, throwing forth ashes and lava at frequent intervals.

ON Friday last the inaugural meeting of the recently constituted Röntgen Society took place at St. Martin's Town Hall, when Prof. Silvanus P. Thompson delivered his presidential address, particulars of which we gather as follows from the *Times*. After giving an account of the circumstances in which Prof. Röntgen made his famous discovery nearly two years ago, and referring to the antecedent investigators of whose work that discovery was a development, Prof. Thompson proceeded to make a brief review of what has been achieved with respect to X-radiations. He first discussed the improvements which have been made in appliances, such as in the construction of the tubes, in the materials used for fluorescent screens, in photographic plates, and in the methods of exciting the tubes. Turning to advances in results attained and to applications of the discovery, he said that, excepting only Lister's introduction of antiseptics and the discovery of anaesthetics, no discovery in the present century had done so much for operative surgery as that of the Röntgen rays. The first great application of the rays had been to the diagnosis of dislocations and fractures, the study of bone disease, and the detection of foreign bodies in various parts of the human frame. The localisation of foreign bodies embedded in more transparent tissue had claimed the attention of many surgeons. In this department Mr. Mackenzie Davidson had devised an ingenious apparatus by which any intelligent person could at once localise to within one-hundredth of an inch the exact position, say, of a needle in the hand or foot, the complicated geometry of oblique projection being simplified down by the instrument itself, and reduced to the application of callipers and a divided scale. As regards the physical problems presented by the rays, while there was much progress to chronicle, there was also a vast prospect opening out of problems awaiting