

of a great master of the art is laid bare for us; and the acquisition of a right method is a greater thing than a mere knowledge of the results: *πλέον ἤμῶν παντός*.

Take as an illustration the interesting indications of the way in which Huxley's mind was feeling its way towards a grasp of evolution. The comparison of the results of philology and embryology in the lecture "On the common plan of animal forms" is curiously suggestive (p. 283). It throws light on what some of us thought a hard saying in his last (as I suppose) public speech made at Oxford, when he said that whether the Darwinian theory remained or fell, the fact of evolution would survive.

It has been said that Huxley made a "stalking-horse" of Darwin, and there is just the amount of truth in this as in every jest. It is evident that Huxley's morphological studies had brought him to the precise point where the "Origin of species" gave him the illumination of which he stood in need. And he seized it with characteristic ardour and enthusiasm. In the case of the cell-theory his mind was not so receptive because not so prepared. "Its value," he says, "is purely anatomical" (p. 220). He could not foresee, and perhaps would not have been justified in foreseeing, that it would supply the future key of our physiology.

And here I must acquit myself of the task which I have reluctantly undertaken. To do any adequate justice to the wealth of accomplished work included in this volume alone is, as I began by saying, wholly beyond my powers. But no intelligent student can turn over these records of Huxley's work without realising the truth of the remark of the editors, that "the progress of biology during the present century was largely due to labours of his of which the public knew nothing." And whatever else such a student may take away from their study, he cannot at least fail to learn how to treat of the most technical matters with the extremity of pregnant and lucid expression.

W. T. THISELTON-DYER.

THE SCIENCE OF APPLIED ELECTRICITY.

Magnets and Electric Currents. By Prof. J. A. Fleming. Pp. xv + 408. (London: E. and F. N. Spon, Ltd., 1898.)

THIS work, as Prof. Fleming explains in his preface, has grown out of, and may be considered as taking the place of, his well-known smaller work, "Short Lectures to Electrical Artisans," published about twelve years ago.

"In recasting the information in such a manner as to conform more nearly to the present state of knowledge the author still desired to fulfil the original aim of supplying electrical artisans and engineering students with a brief and elementary account of the scientific principles underlying modern applications of electricity in engineering. With this object in view the use of mathematical symbols has as far as possible been avoided, but at the same time an endeavour has been made to give the reader clear notions on the quantitative measurements which lie at the root of all application of electrical facts in the arts."

This endeavour is more than justified by the present admirable volume.

After two introductory chapters, one on magnets and

magnetism describing the simpler properties of permanent and electro magnets, and the other on measurement and units in which the bases of physical knowledge and the principles of "absolute" measurement are explained, the quantitative connection between currents and their magnetic effects is discussed under the heading "Magnetic force and magnetic flux." This discussion might equally well have been entitled "the magnetic circuit," as it virtually amounts to an explanation of that useful conception; and it is appropriately followed by a comparison of the present system of measurement with the "rational" system suggested many years ago by Mr. Oliver Heaviside, the advantages of which are particularly striking in magnetic circuit problems. Chapters iv. to vii. deal with electric currents and the theory of their measurement, electromagnetic induction, and electromagnets, with a discussion under the last head of magnetic curves, hysteresis, and the molecular theory of magnetism; chapters viii. and ix. are on the theory of alternating currents and on measuring instruments respectively; and chapter x., a longer one than the rest, is devoted to the various methods of generating currents. The book concludes with an appendix on the measurement of the earth's horizontal magnetic field strength, a table of natural sines, cosines, and tangents, and an index.

From what has been said, it is plain that Dr. Fleming's work is far more than a mere enlarged edition of the "Lectures to Electrical Artisans." It may be best described as a clear and brief—sometimes, we are tempted to think, almost too brief—but always admirably clear account of those parts of electrical theory which should be grasped by the better class of junior student of practical electricity. Such an account has, we venture to think, long been needed. Valuable as are descriptions of such things as Coulomb's balances and Wimshurst machines in the ordinary text-book, the importance of early guiding the thoughts of the youthful electrician into the channels which lead most directly to the regions of his subsequent activity cannot be too strongly emphasised. Life is too short, for all but the very gifted men, to do more than make a distant acquaintance with what, from the electrician's point of view, are the ornamental parts of his science; and it is largely because Dr. Fleming recognises the truth of this, that his book cannot fail to be of very great value to both teachers and students of electrical technology.

A. P. C.

OUR BOOK SHELF.

Natural Hygiene or Healthy Blood, the Essential Condition of Good Health and how to attain it. By H. Lahmann, M.D. Translated from the German by Dr. H. Buttner. Pp. v + 253; plates 5. (London: Swan Sonnenschein and Co., Ltd., 1898.)

THE book before us is a learned exposition which aims at two very laudable objects—the reform of clothing and diet, and the banishment of disease. With regard to clothing little is said: the author's children are represented in a state of nudity; this, together with the prescription of constant air baths, and declamations against the amount of clothing worn by man at the present day, makes one think that in his heart of hearts the author regards the entire disuse of all clothing as the beau ideal.