

The fourth lecture is largely a reprint from Carrière's paper on bud-variation, and from Focke's work on the hybridisation of plants; whilst the fifth contains practical instructions as to the methods of crossing employed by experimenters. A glossary and an index terminate a book which, if it contains little that is not familiar to experts, will be extremely serviceable to beginners, and will furnish the naturalist, who wishes to gain a general survey of the matter, with just the information he requires. For this latter purpose, a fuller bibliography would be an improvement in a new edition.

MAXWELL T. MASTERS.

### OUR BOOK SHELF.

*Die Haustiere und ihre Beziehungen zur Wirtschaft des Menschen.* Eine geographische Studie von Eduard Hahn. Large 8vo, pp. 581, and a map. (Leipzig: Duncker and Humblot, 1896.)

THIS volume is an important contribution to our knowledge of the relations existing between domestic animals and human economy. It forms a large octavo volume of nearly 600 pages, compiled from all sources, and of its interest the reader may form some idea from the following summary of its contents. After a brief introduction, we have our domestic animals considered from a zoological standpoint; here the interesting questions of hybridisation and of the returning of once-domesticated animals to a feral state, are investigated. Next the subject of the profitableness of such animals is considered, the author alluding but casually to the fact that some animals were decidedly domesticated, without an eye to profit; he cites the case of some South American aborigines keeping a "grylla" in their houses for the perfume, but has apparently overlooked the case of the Greeks domesticating the cigale. He on purpose omits the subject of animals in connection with "worship," quoting Tylor, that "it is a subject not wanting in interest, but is one abounding in difficulties."

The list of domesticated animals (using this term in the widest sense of animals kept for the use or service of man) given is a long one, comprising not only such familiar forms as the dog, horse, ass, horned cattle, sheep, goats, reindeer, &c., but also the yak, gaur, llama, guinea-pigs, and ferrets. The list of birds is extensive; reptiles are not mentioned, save the axolotl in an appendix; and among the fishes we find the carp, the gold-fish, and the paradise-fish. Bees and several silk-spinners are mentioned among the insects.

The concluding portion of the work is devoted to economic geography, and is illustrated by a map, in which an attempt is made to mark out the world into areas characterised by aboriginal industries. Certain regions are coloured as being those of the hunters and fishers, then of the several divisions of mankind living upon tubers and cereals, or further advancing to the culture of such plants as sugar-cane, tobacco, and the like; still greater progress is indicated by the type of gardening as practised, for example, by the Chinese. Of the various regions of the world alluded to, that of Australia is the one most unsatisfactorily treated; there is scarcely an allusion to the wonderful culture of vegetables by the Maoris, for a very good knowledge of which we are long since indebted to the labours of Colenso and others. The subject treated of in this volume is of the widest range—in space covering the known world, in time going back to days of indistinct tradition, and for its complete investigation requiring some knowledge of an immense range of literature, this work is a contribution towards this history, and as such is a most useful one.

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### LETTERS TO THE EDITOR.

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#### Velocity of Propagation of Electrostatic Force.

LORD KELVIN, in his letter published in NATURE, February 6, says that "it is an abuse of words to speak of the 'elastic solid theory of electricity and magnetism' when no one has hitherto shown how to find in an elastic solid anything analogous to the attraction between rubbed sealing-wax and a little fragment of paper . . . or between two wires conveying electric currents."

It has, no doubt, escaped Lord Kelvin's notice that in 1884 a paper was published in the *Cambridge Philosophical Transactions* (vol. xiv. p. 45), in which I showed that two spheres pulsating in an elastic medium will, if pulsating in opposite phases, attract each other as sealing-wax attracts paper, and if in the same phase will repel just as like electrified bodies do, the action being propagated in the medium with a finite velocity.

In a subsequent paper, published in 1885 (*Camb. Phil. Trans.*, vol. xiv. p. 188), I have shown that two straight oscillatory twists placed in an elastic medium will, if in the same phase, attract each other as like electric currents do, and if in opposite phases will be repelled. In fact, if the vibration of the surface of a solid placed in a vibrating elastic medium is resolved into normal and tangential vibrations, the normal vibrations will, as pointed out in these papers, cause the solid to exhibit several of the phenomena of statically electrified bodies, while the tangential vibrations will cause it to behave as if carrying a current and acted on by a magnetic field.

I only venture to mention these results because it appears from Lord Kelvin's letter that they are not generally known. They should, I believe, assist in forming a conception of a possible explanation of electric action, based on the supposition of an elastic medium which resists changes of volume and shape.

Firth College, Sheffield, February 11. A. H. LEAHY.

In making the statement quoted, I had fully taken into account all such considerations as those referred to in Prof. Leahy's letter. The rigidity of the solid absolutely prevents any phenomenon, analogous to the attractions by rubbed amber or lodestone, from being exhibited in an elastic solid. No such barrier exists if the elastic medium be fluid; and §§ 733-740 of article<sup>1</sup> xlii. of my "Electrostatics and Magnetism" contain conclusions of hydrokinetic theory regarding mutual forces between movable tubes or rings with cyclic motion of an incompressible liquid through them, showing magnitudes identical with, *but directions exactly opposite to*, those of the forces in electro-magnetic analogues consisting of movable conductors conveying electric currents. The remainder of that article contains remarks on Guthrie's interesting paper<sup>2</sup> "On Approach caused by Vibration," and "On the Attractions and Repulsions due to Vibration," observed by Guthrie and Shellbach," from which the following (§ 744), being an extract from a report, in the *North British Daily Mail*, of an address by myself to the Philosophical Society of Glasgow on December 15, 1870, may possibly be read with interest in connection with Prof. Leahy's letter:—

"The speaker began by stating that interesting papers had recently appeared in the *Proceedings* of the Royal Society and the *Philosophical Magazine*, by Prof. Guthrie, in which some very curious hydrokinetic phenomena were described. From hints and suggestions in his paper, it seems that Prof. Guthrie connected, in his own mind, these phenomena with possibilities of explaining some of the more recondite actions in nature; and he (the speaker) believed that what gave the great charm to these investigations for Prof. Guthrie himself, and no doubt also for many of those who heard his expositions and saw his experiments, was, that the results belong to a class of phenomena to which we may hopefully look for discovering the mechanism of magnetic force, and possibly also the mechanism by which the forces of electricity and of gravity are transmitted. The speaker, however, did not lay any stress at present upon the possibility of applying these results directly to explain magnetism. He believed, on the contrary, that the true kinetic theory of mag-

<sup>1</sup> First published in the *Proc. Roy. Soc. Edinb.* for Feb. 1870.

<sup>2</sup> *Proc. Roy. Soc.*, August 26, 1869.