

calculation. The future must show how far it will be possible to apply to the theory of species the definition of central specific forms, from which varieties calculably diminish in numbers as they depart in type.

E. B. TYLOR

OUR BOOK SHELF

Magnetism. By Sir W. Snow Harris and H. M. Noad. (London: Lockwood and Co.)

THIS is a good book, and we are glad to see the subject of magnetism fully treated in a popularly written text-book. It is a second edition of Sir William Snow Harris's rudimentary treatise, with considerable and important additions by the editor. The part of chief importance which is added is Chapter viii., which deals with the more recent progress of terrestrial magnetism. This chapter consists of thirty pages, and the author has managed to condense into that space a wonderfully large amount of interesting, useful, and accurate information on the subject. In so short a space we must be content with results rather than with particulars, but the matter contained in this chapter, in point of importance, accuracy, and exhaustiveness, places the present treatise, as far as terrestrial magnetism is concerned, much before any similar book with which we are acquainted. The correction of the compass in iron ships is entered into in the last chapter. The telegraph is scarcely touched upon, but this perhaps rather belongs to a treatise on electricity. We have a chapter on theories of terrestrial magnetism. The theory of Gauss should never be classed, as it is here, and indeed as it is generally classed, along with theories like those of Halley or Hanstein, or with such things as electro-magnetic theories and the like. The word "theory" in these cases means quite a different thing from what it means when applied to Gauss's investigations. Hanstein and the like all make some physical hypothesis, which may or may not be the case; but Gauss makes no such assumption at all, except in so far as he supposes that the needle at all parts of the earth's surface is affected by forces due to the same origin, and varying inversely as the square of the distance, which has been experimentally proved to be the law according to which magnetic forces act. He then shows how the effect on a needle can be expressed in terms of an infinite series which is necessarily mathematically convergent and true, and he then uses an approximation to that series, which approximation is justified fully by experiments similar to those made by the late Prof. Forbes at the top and bottom of the Faulhorn. Gauss's theory, then, is a truly scientific theory, inasmuch as it involves no unjustified physical hypothesis, but is a logical deduction from observed facts and established principles, and in this differs radically from the other theories which are too often classed with it. Dr. Noad has been so successful in Chapter viii. that we cannot help wishing he had introduced a chapter also on this subject.

JAMES STUART

The Amateur's Flower-Garden: a Handy Guide to the Formation and Management of the Flower Garden and the Cultivation of Garden Flowers. By Shirley Hibberd. Illustrated with coloured plates and wood engravings. (London: Groombridge and Son, 1871.)

MR. HIBBERD is a practised writer on gardening subjects, though his books have not much claim to be considered as scientific treatises, but rather as pretty gift-books to lie on the drawing-room table and give to its furniture a quasi-scientific air. That they have their use cannot be doubted, but it is not a very high one. The worst part of this book is the illustrations. From the letter-press may be doubtless culled some useful hints as to the planting and management of a flower-garden,

though we do not think it equal in this respect to some other works, such as those by Mr. Robinson, which are less under the trammels of time-honoured prejudices and superstitions. But many of the illustrations, including some of the woodcuts and nearly all the coloured plates, are simply atrocious. The drawings of a show pelargonium (p. 80), pansy (p. 45), ranunculus (p. 156), carnation (p. 117), and some others, are mere caricatures, and unworthy of a place in any work which bears the least pretensions to a scientific character.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. No notice is taken of anonymous communications.]

The Survival of the Fittest

I HAD designed sending a note to you, critical of the abstract of my paper on "The Laws of Organic Development," republished from the *American Naturalist* in one of your recent issues, before I read the remarks of Mr. Spencer in your number of February 1.

If Mr. Spencer will examine the Essay itself (for sale by McCalla and Stavelly, 237, Dock Street, Phila., or Naturalists' Book Agency, Salem, Mass.)* he will find that I have there exclusively employed his phrase "Survival of the Fittest." The expression "Preservation of the Fittest," not used by Mr. Spencer, was inadvertently introduced in writing the abstract. This was done hurriedly between the sittings of the Amer. Assoc. Adv. Sci. for a reporter of the *New York Tribune*, and was subsequently printed by the *Naturalist* while I was absent on the Plains of Kansas. It therefore contains several obscurities, the result of an attempt to abridge, and a number of typographical blunders. The essay will be found to be free from these.

There being no misrepresentation of Mr. Spencer's views on this point, I notice the second objection he makes. Where, in the sentence regarding the Survival of the Fittest, I say that "this neat expression no doubt covers the case, but it leaves the origin of the fittest entirely untouched," Mr. Spencer regards my language as an "indirect statement that I" (Mr. S.) "have done nothing to explain the origin of the fittest."

It is plain enough that my remark does not apply to Mr. Spencer or to his writings, but exclusively to the doctrine of Natural Selection, and to Mr. Spencer's terse phrase, "which no doubt covers the case," *i. e.* Natural Selection (not the whole theory of Evolution). I cannot see that this language can be tortured into the interpretation Mr. Spencer places upon it, but Mr. Spencer's language decidedly implies that my statement is literally correct.

I am, however, well aware that Mr. Spencer has done more than any living man to explain the "Origin of the Fittest," and on this account in particular his name does not appear in my criticism. Another reason for its omission is that I have taken the liberty not to read his work, "The Principles of Biology," because I have suspected, from my reading of other works of this philosopher, that it is in advance of other treatises on the subject. I postponed it until, by investigation "in the shop," I should have attained to some definite views based on reasoning un-influenced by the opinions of others, hoping to use "The Principles of Biology" thereafter in such a way as its merits and justice to its author should require.

EDWARD D. COPE

Philadelphia, Feb. 20

Ethnology and Spiritualism

THERE is only one point in Mr. Tylor's communication (*NATURE*, Feb. 29, p. 343) on which it seems desirable that I should say a few words, in order that I may not be supposed to assent to what I conceive to be a most erroneous view. Mr. Tylor suggests that the phenomena that occur in the presence of what are called mediums, are or may be of the same nature as the subjective impressions of persons under the influence of a powerful mesmeriser. Five and twenty years ago I was myself

* Under the title, "The Method of Creation of Organic Types."