

insects, and then, after noticing the Chermes that attacks that very strong food the larch, we come to a full description of *Phylloxera vastatrix*. The Hemiptera are shortly mentioned, and then the Myriopoda. There is a good picture of *Geophilus* clinging around its great prey, a large earthworm, and also of a *Polydesmus*. Amongst the Scorpions the long-armed *Phrynus* and *Gonoleptes*, and amongst the Spiders a long *Tetragnatha* and the extraordinary-bellied *Gasteracantha*, form admirable illustrations. A short chapter on *Pycnogonum* and *Nymphon* concludes this really wonderful volume. P. M. D.

### OUR BOOK SHELF

*Heat.* By B. Loewy (Lardner's Handbook of Natural Philosophy. Crosby Lockwood and Co., 1877.)

THIS, though not a bulky book, is a sort of miniature Encyclopædia of the subject. So far as we have read it it seems to have all the faults of the original (?) work to which Lardner's name was prefixed, with the important exception of the inaccuracies. These have been to a great extent removed, and the work has been brought up to date, but there is still the woeful want of order, or indeed of any guiding principle whatever which distinguished the former editions. It is a very curious mixture of good and bad, and cannot be called, in any sense, attractive to the reader. Numerous tables of experimental data are given, but they are in many cases carried to a number of places of figures quite beyond the present power of experimental science. Two, or perhaps three of the figures in the earlier places of each number are probably correct; the others give a show of minute accuracy which may altogether deceive the beginner. The treatment of the theoretical part is very meagre, but in the experimental part many curious facts not usually known are given. The book may be useful as a work of reference to those who are not in possession of Balfour Stewart's treatise, but we cannot say more in its favour.

*Ferns, British and Foreign. The History, Organography, Classification, and Enumeration of the Species of Garden Ferns, with a Treatise on their Cultivation.* By John Smith, A.L.S., Ex-Curator of the Royal Gardens, Kew. New and Enlarged Edition. (London: Hardwicke and Bogue, 1877.)

THAT Mr. Smith's "Ferns, British and Foreign" should have reached a new edition in a comparatively short time is no small tribute to its value as a book of reference for amateurs and fern cultivators. The chief portion of this very neatly got up work is occupied by an enumeration of cultivated ferns. The different genera, as understood by the author, who was one of the foremost pteridologists of his day, are described and figured, while a list of the cultivated forms, with synonyms and range of geographical distribution, follow under each genus, no attempt being made to give a diagnosis of the species. The scope of the work is therefore entirely different from that of the "Synopsis Filicum" of Hooker and Baker. The classification adopted is that propounded by Mr. Smith in his early publication on ferns, an arrangement not much used by modern writers. An appendix of recently-introduced ferns is given. These have been collected and arranged under their respective genera and tribes, as their names have from time to time been noticed in the horticultural journals and in nurserymen's catalogues. The list has thus no pretensions to be a critical one. The most interesting part of the book is the history of the introduction of exotic ferns, a subject about which, probably, no man living knows more than Mr. Smith. This is followed by an explanation of terms used in describing ferns, perhaps the least satisfactory part of the whole volume, as many of the terms are more or less

obsolete, or only used in the book now before us. In this section nothing is said about the recent researches into the nature of the prothallus, construction of the reproductive organs, and morphological nature of the sporangia. The last part of the work is occupied by an essay on the cultivation of ferns, reprinted without alteration from the first edition, but giving the results of long experience of the successful cultivation of all groups of ferns. As a work of reference and guide to the cultivation, this book will most undoubtedly be of great service to the fern-growing public.

### LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.]

#### The Radiometer and its Lessons

I HAVE little doubt that Prof. Osborne Reynolds is much more competent than I am to say what is or is not consistent with the kinetic theory of gases, but I hardly think that he gives evidence of this in his letter to last week's NATURE (p. 27). Unless my ignorance of the matter is more complete than I am aware of, the law that the rate of communication of heat to a gas is independent of the density, applies only when the space occupied by the gas is so great, or the variations of density so small, that these variations do not alter the temperatures of those portions of the gas which are at each instant respectively receiving and giving out heat. This condition cannot, I imagine, be fulfilled in the radiometer, where it seems to me inevitable that an action of the kind to which Mr. Johnstone Stoney called attention must take place. G. CAREY FOSTER

P.S.—Since writing my previous letter to NATURE, a fortnight ago, I have read a paper by Mr. R. Finkener, in *Poggendorff's Annalen* (vol. clviii. pp. 572-595). This paper contains, besides a theoretical investigation of the motion of the radiometer founded on the kinetic theory of gases, an experimental proof that the action becomes much less when an extremely high degree of rarefaction is reached. The paper itself is not dated, but, as the Part of the *Annalen* which contains it was "closed" on July 31, 1876, the experiments described in it cannot have been much, if at all, subsequent to those (communicated to the Royal Society, June 13, 1876) which led Mr. Crookes to a like result. G. C. F.

UNTIL I read Dr. Carpenter's letter in your issue of the 8th inst., it had never occurred to me that his "special purpose" was to bring out strongly my "thoroughly scientific and philosophical method!" This is an act of disinterested kindness which recalls to me the exquisite truth of Dean Swift's remark, "No enemy can match a friend."

Dr. Carpenter's only reply to my letter which appeared in your issue of the 1st inst. is contained in the following passage:—"If I had not found," he says, "after the publication of my Lectures, that he had himself been 'digging up the hatchet,' which I was quite disposed to keep buried, by giving his public attestation to the 'spiritualistic' genuineness of what had been proved to be a most barefaced imposture, I should not have again brought his name into the controversy."

Further on Dr. Carpenter paraphrases passages from his article in *Fraser's Magazine* for this month, in which he goes more into detail touching this "public attestation," of which in his eyes I stand accused.

"Eva Fay," he says, "returned to the United States, carrying with her a letter from Mr. Crookes, which set forth that since doubts had been thrown on the Spiritualistic nature of her 'manifestations,' and since he in common with other Fellows of the Royal Society had satisfied himself of their genuineness by 'scientific tests,' he willingly gave her the benefit of his attestation. This letter was published in *facsimile* in American newspapers."

My answer to this calumny shall be brief.

It is untrue that I dug up the hatchet—Dr. Carpenter's