

of legs. Dr. Thorell appears somewhat to doubt Mr. Blackwall's position, that this organ is in all cases a true spinning apparatus; the better opinion would appear to be that it is so.

The work ends with some very valuable remarks on the general classification of the Araneidea, or (as Dr. Thorell, with good reason, prefers to call the order of spiders) Araneæ, pp. 597—607. Within this compass some recent works and suggestions on the systematic classification of spiders by Dr. Ludwig Koch, Rev. O. P. Cambridge, Anton Ausserer, and others are reviewed and criticised; the conclusion come to being that the new and highly remarkable forms brought to our knowledge by the researches of later years shows more than ever "that a fully satisfactory classification of the order of spiders is a thing not soon to be expected, and that a by no means inconsiderable number of forms cannot without great uncertainty, even if at all, be included under the hitherto received families and higher groups." Undoubtedly, towards this satisfactory classification, by whomsoever it may be finally effected, Dr. Thorell has done good work in the volume on "European Spiders," and that on their "Synonyms." The systematiser hardly exists yet who could say with truth that he had risen from a perusal of these volumes without considerable alteration, or, at least, modification, of his own previous views on the subject.

With so much to commend, in the work under review, it may perhaps appear invidious to notice what seem, to be a defect, at least in point of form. In the course of the minute and extensive investigation of specimens, descriptions, and figures necessary to arrive at a satisfactory determination of obscure synonyma, species here and there appeared to be new to Science, and others to require separation (under other names, and with a fresh description) from those with which they had before been confounded; these new and separate species Dr. Thorell has described in extended notes, *in loco*, in a smaller type, thus marring the continuity, and breaking in upon the expressed design of the work. Would not these descriptions have come in better, and have been more useful for study and reference, had they formed an appendix to the work?

Another defect (though its rectification might perhaps be said to have been a departure from the strict design of the work) appears to be that Dr. Thorell does not include in his volume *all* the spiders at present known to be indigenous to Europe; it details those described by Westring and Blackwall, with some others given in M. Simon's catalogue, as well as, incidentally, many more described by other authors; but still it leaves unnoticed other described species. It would have given the work a great additional value had there been a general list of all the (at that present time recorded) spiders of Europe in systematic order, or, at least, a supplementary one of all those species mentioned or detailed throughout the work, in addition to those of Blackwall and Westring. This is, however, as before hinted, rather a criticism upon the design than the execution of the work, though it seems to be invited by the author's having so far departed from his own original design as to include descriptions of new species, as well as notices of others besides these included in "Araneæ Suecicæ," "Spiders of Great Britain and Ireland," and the "Catalogue Synonymique."

It would be scarcely proper to conclude this notice of a scientific work written by a native of Sweden, without a remark upon its being written in English, and a well-deserved compliment upon the exceeding clearness and terseness of the style, and its generally happy accuracy of expression.

Dr. Thorell's own opinion—expressed in a note to page 583—and in which most English-writing naturalists will probably acquiesce—is that English will one day become the common scientific language of the world, not only because it "is far more widely diffused over every part of the earth than any other culture-language, and that already two of the greatest nations publish in it the results of their scientific labours, but because English, on account of its simple grammar, and as combining in nearly the same degree Teutonic and Romanic elements, is by most Europeans more easily acquired than any other language." The opinion, however (given in the same note *l.c.*), in regard to works written in little-understood languages, such as Russian, Polish, Bohemian, Finnish, or Magyar, will hardly be endorsed. Dr. Thorell would exclude works written in these or such like languages, from equal scientific weight with others written in French, English, German &c., *i.e.*, he would not apply to the former the rules, as to priority, applied to these latter. Now, however grateful it would be to Western naturalists to have all works on Natural Science published in languages with which they are ordinarily more or less familiar, yet it would be rather too hard upon other nations, to whom the love of natural history has come sooner than a general philological culture, to be excluded from equal scientific rights with their more advanced brethren in the West. It would seem quite as just, if not more so, that if a penalty is to be paid for ignorance of foreign tongues, it should fall rather upon those who, with whatever trouble and inconvenience, certainly might become acquainted with works on Science in any language, than upon those who, preferring to write in that tongue in which they can undoubtedly think most clearly and best express their thoughts, give the results of their scientific labours in the vernacular. By all means let us have, if possible, a common scientific language, but meantime, if it be so, we must put up with the occasional annoyance of finding that a genus or species which we had fondly imagined we were the first to describe, had already, perhaps long, been well described, and possibly figured, in some unheard-of work written in an outlandish tongue not understood of the Western Scientific World.

OUR BOOK SHELF

A History of the Birds of Europe. Parts 18, 19, 20.
By H. E. Dresser, F.Z.S., &c. (Published by the Author at 11, Hanover Square.)

THIS fine work continues to appear with commendable regularity every month, and keeps up its high character both for fulness of information and beauty of illustration. In the numbers now noticed are several highly artistic plates, such as those which represent the White-shouldered and Imperial Eagles, the Great Black-headed Gull, the Common Crane, the White Stork, and the Great Bustard, which each form a perfect picture. We find full but not too lengthy articles on all these, as well as on the Black Grouse, the Curlew, and many smaller birds. An excellent plan is adopted, in the more characteristic and difficult European genera, of giving a list of all the

known species, with notes of their distinguishing characters and geographical distribution. One of the most rare and interesting species figured (in Part 20) is the Teydean Chaffinch, a bird of a blue colour, and which is confined to the upper limits of the pine forests of the Peak of Teneriffe, and to the desolate plains above them, feeding on the seeds of the Retanca (a broom-like plant) and the *Adenocarpus frankenoides*, which characterise those regions, as well as on the seeds of *Pinus canariensis*.

A. R. W.

Lehrbuch der Physik, von Dr. Paul Reis (Dritte Lieferung). Leipzig: 1873.

THIS forms the concluding part of Dr. Reis's useful handbook of Physics. The subject of physiological optics is continued, followed by a description of optical instruments and the laws of the interference and polarisation of light. Heat is treated in the next part, but hardly so fully nor so well as light; radiant heat, for example, occupying less prominence than it deserves. Considerable space is devoted to the explanation of machines for the conversion of heat into motive power: thus we have some of the various forms of steam-engine described, together with a full account of Ericson's heat-engine and Lenoir's gas-engine. Magnetism follows heat, and then we come to static and dynamic electricity and the practical application of electricity. The book closes with a few chapters devoted to the physics of the heavens, or in other words a briefsketch of popular astronomy and meteorology. The principal defect of this handbook is the want of sufficient woodcuts to illustrate the apparatus referred to. The whole work exhibits the characteristic solidity and thoroughness of the German race, and is a marked contrast to some of the recent French popular text-books on Science, the profuse and beautiful illustrations in which almost supplant the letterpress. Let us flatter ourselves that in our nation these complementary races intermingle.

LETTERS TO THE EDITOR

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

Tyndall and Forbes

It will probably be considered necessary that Dr. Tyndall's pamphlet,* which first appeared as an article in the *Contemporary Review*, be answered at full length. That, however, cannot be decided for some time, as several of those concerned are abroad; but it may be well to let Dr. Tyndall know at once that there is no difficulty whatever in answering him, and that the answer will not lose force or point by a little delay. In the meantime I hope you will give me space to briefly notice a few of the more obvious inconsistencies of Dr. Tyndall's article.

1. Dr. Tyndall is astonished that the "blameless advent" of his "innocent" "modest" "unpretending" volume should be looked upon as reiterating charges made against Forbes. An extract or two will settle this point.

a. "Hail he (Rendu) added to his other endowments the practical skill of a land-surveyor, he would now be regarded as the prince of glacialists."

"Professor Forbes, when he began his investigations, was acquainted with the labours of Rendu. In his earliest works upon the Alps he refers to those labours in terms of flattering recognition. But though as a matter of fact Rendu's ideas were there to prompt him, it would be too much to say that he needed their inspiration."

Put these two passages into straightforward English, instead of Dr. Tyndall's favourite style of insinuation, and they amount to this: that Forbes, having the accomplishments of a land-surveyor, and being acquainted with Rendu's work, put this and that together and appropriated the discovery.

b. Forbes had, in 1860, minutely informed Dr. Tyndall of the nature and amount of his knowledge of Rendu in 1842. It

* Principal Forbes and his Biographers.

is not too much to say that Dr. Tyndall's sentence quoted above is utterly inconsistent with the plain statement of Forbes, and so implies a serious personal charge against the latter.

c. A similar serious charge is made, when Dr. Tyndall, knowing that Forbes asserted that it was at his suggestion that Agassiz employed a theodolite or a fixed telescope, and that this had never been denied, carefully states that "the same instrument was employed the same year by the late Principal Forbes upon the Mer de Glace," and that "we are now on the point of seeing such instruments introduced almost simultaneously by M. Agassiz on the glacier of the Unteraar, and by Prof. Forbes on the Mer de Glace."

2. Dr. Tyndall tells us that his work was originally commenced as a boy's book, but that "the incidents of the past year" (i.e. his controversy with Forbes) caused him to deviate from this intention. Have boys so altered since 1859 that such controversy has now become suitable for them when supplied in the "International Series"?

3. What I said with reference to the unpublished correspondence of Forbes was said without any special reference to Dr. Tyndall. It was simply my excuse to the reader for the very meagre use I had made of so extensive and valuable a collection.

But, even in this matter Dr. Tyndall's inconsistency is patent. He says that, longing for peace, he abstained from answering Forbes, not from inability to do so, but to avoid making Science the arena of personal controversy. Yet, in the same breath, he not only complains of my not publishing certain letters which he supposes to contain charges against himself, but (see § 5 below) insinuates that I am acting from feelings of animosity!!

4. Dr. Tyndall's answer to one of Forbes' charges is certainly to some extent plausible. I can say no more till I have an opportunity of consulting Rendu, for it is quite obvious that it is possible by proper selection of portions of so vaguely-written a book to make him appear to say anything one chooses.

Dr. Tyndall's answer to the other charge is so obviously insufficient that I need not deal with it here.

But more than this:—no ever-so-complete defence of himself on one or two points is any reply to the overwhelming pamphlet of Forbes, every line of which in its calm truthfulness calls for an answer.

5. Dr. Tyndall refers to former controversy between us, and to its happy termination at a personal interview. Why Dr. Tyndall should bring before the public such matters as a private reconciliation, unless with the object of holding me up to scorn as the breaker of a solemn truce, I altogether fail to see. I need scarcely say that no one in his senses would enter into an agreement never in future to differ from another, nor to point out in his writings passages calculated to mislead. But the following, and other passages which I need not cite, are all so many half-mysterious insinuations (of the Tyndall kind) against me, and all tend towards the same implied accusations.

"... the fire was not extinct: the anger of former combats, which I thought spent, was still potential, and my little book was but the finger which pulled the trigger of an already loaded gun."

I shall be obliged by Dr. Tyndall's pointing out to me a single expression, in that part of Forbes' Life which was written by me, which is calculated to give him the slightest offence:—with the one exception of a letter from Forbes, which was specially written for publication; and which, for Forbes' own sake, I would rather not have published.

No doubt he may be annoyed by my saying that little has since been added to the observations made by Forbes on glaciers. This is a matter of opinion. I do not think that Dr. Tyndall has made any addition of consequence to our knowledge of glaciers, and I am supported in this belief by many of the very highest authorities. But this is no charge against Dr. Tyndall.

6. When I saw the "Forms of Water, &c.," I added a brief and excessively temperate statement to what I had already written, and I republished Forbes' own defence of himself against Tyndall and Agassiz. Was I not bound to do something, and could I possibly have done less?

7. The rupture of the truce, or "peace," whatever that may be, was the work of Dr. Tyndall himself—partly by his "Forms of Water, &c." mainly by his article in the *Contemporary Review*. So far as I am personally concerned, the public has no right to know my feelings:—but, whatever they are, they are mingled with the satisfaction I experience in being once more free, as of old, to point out to the public the misleading passages and actual