

able to accomplish it within a reasonably short period. As a matter of fact, he says, the enterprise "has taken me as many years to finish as I expected it would have taken months." The "Index" does not relate to all the papers published by Gould in various journals, but it does include every work which he issued separately, whether in folio, or octavo, or quarto form; and Mr. Sharpe, with the aid of his assistant at the Natural History Museum, has been careful to check the various references, the number of which is nearly seventeen thousand. He has also put in some "extra synonyms from popular works, such, for instance, as Oates's 'Birds of British India,' which in a few years will have familiarised Indian naturalists and sportsmen with a certain set of names which do not occur in Gould's works though the species may be duly figured therein." The work, which is very handsomely "got up," will be of great value to all who are fortunate enough to possess Gould's writings, and it will frequently be of good service to every serious student of ornithology. In the biographical memoir Mr. Sharpe not only presents the leading facts of Gould's career, but has much that is fresh and interesting to say about the results of his scientific labours and about the essential qualities of his character.

An Elementary Treatise on Pure Geometry, with numerous examples. By J. W. Russell. (Oxford: Clarendon Press, 1893.)

THE opening sentence of the Preface—"The author has attempted to bring together all the well-known theorems and examples connected with Harmonics, Anharmonics, Involution, Projection (including Homology), and Reciprocation"—indicates that the writer has given himself a "tall order." Within the limits of 323 pages we have here collected every possible property that a student can desire to have. Our only objection to the book is that it is too full for ordinary purposes, but as the matter is put together with considerable skill and ability—thus evidencing the writer's familiarity with, and mastery over, his subject—and illustrated with a choice collection of worked-out exercises, we cordially commend it. We could wish that a handbook for school use were founded upon it. There used to be a rumour abroad that the late Prof. Henry Smith intended to publish his Geometrical Lectures. That hope is now, we presume, frustrated, but as Mr. Russell's first lessons in Pure Geometry were learnt from Mr. Smith's lectures, and as many of the proofs of the present work are derived from the same source, we must possibly take it as the substitute for the "Geometrical Lectures." The get-up of the text is on the usual lines of the Clarendon Press and is all that one could desire.

Sun, Moon, and Stars: Astronomy for Beginners. By A. Gilberne. (Seeley and Co., Limited).

THIS small book comprises 300 pages of matter, and contains a most interesting account of the various members of the solar system and other celestial objects more remote. The narrative is particularly adapted to a large class of people who desire to know somewhat of the wonders and awe-inspiring phenomena connected with the science of astronomy without making a special study of them; yet sufficient interest is aroused to induce a beginner to search for more information. The work, however, does not claim to be a text book, although to a beginner it will serve as a capital starting-point. It is printed in open and pleasing type, and contains instructive illustrations. A few passages might be somewhat improved upon, as for example, p. 143—

"It is said that a cannon-ball, reposing on the sun, if lifted one inch and allowed to fall, would dash against the ground with a speed three times greater than that of our fastest express-trains."

NO. 1231, VOL. 48]

LETTERS TO THE EDITOR.

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Mr. H. O. Forbes's Discoveries in the Chatham Islands.

UNWILLING as I am to interpose in the discussion between Mr. Wallace and Mr. Forbes (*supra* pp. 27, 74), yet each of those gentlemen having referred to opinions formerly expressed by my brother and myself, it seems fitting that I should offer a few words on the present occasion, if it were only to avoid misapprehension; but I would premise that I have not seen Mr. Forbes's paper read before the Geographical Society or his article in the *Fortnightly Review*. To this I would add that I am no more ashamed of opinions in the utterance of which before the Royal Society in 1868 I took a share, than I am of having then been a quarter of a century younger than I am now. Whether they are to be considered modified by what I published some halfdozen years later, when I next touched upon the subject, I do not greatly care, and leave to the judgment of those (if any there be) who may take the trouble of comparing the passage in the *Philosophical Transactions* (1869, pp. 357, 358) with that in the "Encyclopædia Britannica" (ed. 9, iii. p. 760); and what I now think, or at least thought some eighteen months ago, when the last thing I wrote on the question was passed for press, will I hope be before the public in October.

However I would point out that one thing seems needed to make this discussion real, and that is proof of the assertion, made in *NATURE*—at first tentatively (xlv. p. 416), then positively (*tom. cit.*, p. 580), and again with fuller details (xlvi. p. 252), that *Aphanapteryx* ever inhabited the Chatham Islands. Mr. Forbes has been so kind as to show me on two occasions the bones which he ascribed to a species of that genus, and I was fortunately able to let him compare them with those of the real *Aphanapteryx* in the Museum of this University, being all that have as yet been recovered from Mauritius. I pointed out to him differences between the remains of the two forms which appeared to me of generic value, and I thought I had satisfied him on this score, since he did me the honour of asking me to suggest a new name for the form which he had discovered. In that view I was confirmed by finding that, shortly after his last visit to Cambridge, he described the Chatham-Islands bird as *Diaphorapteryx* at a meeting of the British Ornithologists' Club on 21 December, 1892, as I learn from its printed *Bulletin* (No. IV. p. xxi.). All this would matter little to any but specialists did it not seem that what Mr. Wallace rightly terms a "tremendous hypothesis" is based on the asserted existence of *Aphanapteryx* in the Chatham Islands, and I understand that, on the strength of the assertion, further daring speculations have been indulged in, to support which Purple Waterhens, extinct or expiring Starlings, and what beside I know not, have been dragged in. Whether the additional evidence is worth anything remains to be seen; but though I fully recognise the importance of Mr. Forbes's discoveries, rightly interpreted, we are as yet without proof that *Aphanapteryx* inhabited any part of the New Zealand Region; and if it did not, then as regards the speculations based upon it *cadit questio*.

ALFRED NEWTON.

Magdalene College, Cambridge, 27 May.

The Fundamental Axioms of Dynamics.

REFERRING to my previous article in *NATURE* on the above subject (May 18, vol. xlvi. p. 62), there are a few explanatory remarks which may be usefully made,—most of them suggested by the recent discussion at the Physical Society, especially as summarised by the President (Prof. Rücker).

There seems to be some feeling against the advisability of ascending successive steps in a ladder of reasoning unless there be already some perception as to what is to be met with on the top. If the ladder shows signs of ending in a medium of unknown and in some respects paradoxical properties, that fact appears to be felt as an inducement to mistrust the steps which lead thither.

But it must surely be admitted that if each rung is in itself firm and strong, and if successive rungs follow one another with a reasonable amount of sequence, then we ought fearlessly to