slipshod character of some of the forms of experiment recommended. The book will supply suggestions which will be found useful by some teachers, but the reference to apparatus unfamiliar on this side the Atlantic may be a slight bar to its adoption here. W. A. T.

OUR BOOK SHELF.

Elementary Geography of the British Colonies. By George M. Dawson, LL.D., F.R.S., and Alexander Sutherland, M.A. With Illustrations. (London: Macmillan and Co., 1892.)

THIS volume forms one of the well-known geographical series edited by Sir Archibald Geikie. The part of it for which Dr. Dawson is responsible is that which deals with the British possessions in North America, the West Indies, and the southern part of the South Atlantic Ocean. Mr. Sutherland describes the British colonies, dependencies, and protectorates in the northern part of the South Atlantic, Mediterranean Sea, Africa, Asia (exclusive of India and Ceylon, which are described in a separate volume of the series, by Mr. H. F. Blanford), Australasia, and Oceania. Both writers have enlightened ideas as to the needs of those for whom such books are prepared. They have carefully avoided the bringing together of masses of uninteresting detail, their chief object being to convey a good general idea of the physical features and resources of the British colonies, and of the various ways in which these have affected the distribution of the population and the growth of industry and commerce. The facts are presented simply and clearly, and every page contains statements which an intelligent teacher would have no difficulty in using as texts for pleasant and profitable instruction. Most of the illustrations are from photographs, but there are also several very effective engravings from original drawings by Mr. Pritchett.

Farmyard Manure. By C. M. Aikman, M.A., B.Sc. (Edinburgh and London: Blackwood, 1892.)

WE are told in the preface that this little work is in substance a chapter from a larger work on "Soils and Manures," on which the author is at present engaged. Perhaps we may be excused if we fail to see the necessity of publishing this chapter separately in advance. It certainly contains much information from German works, such as Heiden's "Düngerlehre," but the book is written mainly from the chemist's point of view and not from the farmer's. The pamphlet gives one the impression of having been hurriedly prepared, but no doubt its deficiencies will be remedied in the larger book.

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 intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

Peripatus from St. Vincent.

SOME of the readers of NATURE will doubtless be interested to learn that, while collecting in St. Vincent on behalf of the Committee appointed for the investigation of the fauna and flora of the Lesser Antilles, Mr. H. H. Smith obtained five examples of the genus *Peripatus*.

The importance of the discovery, or rather rediscovery, of this Arthropod in St. Vincent rests upon the fact that the Rev. L. Guilding procured the first recorded examples of the genus in this same island. A description of these, under the name *juliformis*, was published by this naturalist in 1826, in vol. ii. of the *Zoological Journal*. But from that time until now, a period of 66 years, no additional specimens have been brought to light in this locality; and since Guilding's types have been lost sight of, and his description of them is wanting in detail, the identity of *juliformis* has been involved in considerable obscurity. There can, however, be little if any doubt that the examples collected by Mr. H. H. Smith are specifically identical with those that Guilding described. Nevertheless this assumption receives more support from identity of locality than from the agreement that obtains between the description of *juliformis* and the specimens before me. The largest of these measures 43 mm. in length and 6·5 in width; the smallest, on the contrary, is only 13 mm. long. One example has 34 pairs of legs, two of them 33, one 30, and one 29. The colour of the lower surface may be described as fawn; that of the dorsal side varies from fawn to blackish grey.

Those who are familiar with Mr. Smith's qualifications as a collector need hardly be told that the specimens are on the whole in a satisfactory state of preservation. I consequently hope to be able to prepare a detailed description of the species, to be incorporated in the report upon the Myriopoda of the Lesser Antilles, the identification of the species of this group, together with that of the Scorpions, Pedipalpi, and fresh-water Decapoda, having been kindly intrusted to my care by the members of the Exploration Committee. R. I. POCOCK.

Natural History Museum, May 27.

The Line Spectra of the Elements.

I QUITE agree with Prof. Stoney that Fourier's theorem can be applied to motions which approximate to non-periodic motions in any assigned degree, and for any assigned time. And so the co-ordinates of any arbitrary motion may approximately in any assigned degree and for any assigned time be represented by formulas of this kind:—

$$a_0 + a_1 \sin\left(\frac{m_1 t}{j} + \alpha_1\right) + a_2 \sin\left(\frac{m_2 t}{j} + \alpha_2\right) + \ldots + a_n \sin\left(\frac{m_n t}{j} + \alpha_n\right),$$

where $m_1, m_2, \ldots m_n$ are positive integers, and j must be chosen sufficiently large to suit the length of the assigned time. This is not the point in Prof. Stoney's reasoning to which I object.

What I want to say is this: If the motion is not periodical, the periods of the circular functions, as well as the amplitudes and phases, are not necessarily definite. That is to say, if we choose a larger value of j, to get a closer approximation for a longer time, the values of a, $\frac{m}{j}$, α do not necessarily approach definite values, but may become totally different.

Take, for instance, the equation—

$$t = 2j\left[\sin\frac{t}{j} - \tfrac{1}{2}\sin\frac{2t}{j} + \tfrac{1}{3}\sin\frac{3t}{j} - \ldots\right],$$

which holds good for all values of t between $-j$ and $+j$. Prof. Stoney may say that Fourier's theorem can be applied to the function t. So it can, certainly, if an interval is assigned. But the amplitudes and periods of the single terms are not independent of the length of the interval, and do not approach definite values when the interval increases indefinitely.

The time during which the approximation is to hold good need not be indefinitely long. But the time must be long in comparison with the longest of the periods. Motions of the ether that are represented by such functions will be resolved by a diffraction grating into different rays, but others will not. Prof. Stoney has not noticed that a distinct property of the function is wanted in order to get a proper resolution into a sum of circular functions. His reasonings in chapter iv. of his memoir on the cause of double lines, &c. (Transactions of the Royal Dublin Society, 1891), refer to all functions with or without this property, and therefore do not seem to me to be correct. But I admit that my expression in the passage quoted by Prof. Stoney might have been clearer. C. RUNGE.

Techn. Hochschule, Hannover, May 19.

Maxwell's Law of Distribution of Energy.

IN the current number of the *Philosophical Magazine*, Lord Kelvin describes a dynamical system in which when in stationary