method is described in a text-book, its advantages will become more generally known.

Mr. Brough deserves much praise for the care with which he has searched European and American publications so as to bring his work up to date, and there is little call for censure save upon minor points which do not affect the general value of the text-book.

It is time that some one should enter a protest against two of the technical terms defined by the author, and frequently met with in the reports of mining experts, viz. "country rock" and "gangue." To say "country rock" is tautology. The word "country" alone, as used in Cornwall, means "surrounding rock" or "enclosing rock," and, if the provincialism is to be adopted, there is no necessity to add the word "rock." The word "gangue" is objectionable, because it has come to us through Frenchmen, who apparently did not thoroughly understand the meaning of the German word "Gang." "Matrix," "lodestuff," and "veinstuff" are better words than "gangue," which might well be allowed to drop out of mining books, especially as it is rarely heard at mines.

To cite the china clay deposits of Cornwall as examples of *stockworks* is unfortunate, because the occurrence in them of veins bearing workable quantities of tin ore is the exception, not the rule.

In Chapter VIII. Mr. Brough says: "In 1798 Breithaupt, of Cassel, invented a mine-surveying instrument, which he called an *astrolabium*." This remark is not correct, for, as the author well knows, the astrolabe was invented by the ancients. The statement should have been that H. C. W. Breithaupt was one of the first to put an astrolabe upon a stand and use it for surveying underground. According to Mr. Brough the theodolite has been employed more or less for mine surveys since 1836. This date is probably correct as far as Germany is concerned; but as a matter of fact a mining theodolite was supplied to the Imperial Brazilian Mining Association four years earlier.

The description of Prof. Borcher's method of using magnets for ascertaining the precise line in which one should continue to work in order to connect two drivages in opposite directions which are approaching each other, is not so clear as it ought to be. Mr. Brough omits to explain, in reference to Fig. 101, that by construction the points A, B, and C are situated upon the circumference of a circle, the centre of which is E; and the confusion is increased by the statement that the triangle A E C is "equilateral," whereas it is really only isosceles. The consequence is that the reader is very much puzzled.

However, these and a few other errors can easily be corrected in a second edition, which is likely to be required before many years are past; because, as soon as the book becomes known, no English-speaking mine-agent or mining student will consider his technical library complete without it. C. LE NEVE FOSTER.

OUR BOOK SHELF.

Charles A. Gillig's Tours and Excursions in Great Britain. By Stephen F. Smart. (London: United States Exchange, 1888.)

THIS book is intended in the first instance for Americans, but it may also be of some service to English tourists. Taking London as a central point—"not only because it is the most notable city of the world, but because it is the Mecca, if not the El Medina, of trans-Atlantic tourists, at least"—the author describes a series of excursions, any one of which will well repay the trouble of those who may elect to follow his guidance. He also describes various tours in Wales and Scotland. Mr. Smart has been at pains to make himself familiar with the ground over which he undertakes to lead others, and the information he presents, so far as we have been able to test it, is thoroughly trustworthy. Of course, no one who wishes to obtain a full account of any particular town or district will think of consulting this little book. But as a general sketch, it has considerable merits; and it will doubtless help many American visitors to make the most of a brief visit to Great Britain.

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.*]

The Supply of Bait for Sea-Fishermen.

ONE of the first questions of practical importance with which the Marine Biological Association has to deal is that of supplying the long-line fishermen with a continuous supply of bait at a cheap rate. Great distress is often occasioned through fishermen being unable to get the necessary bait for their long lines. Mr. Robert Bayly, of Plymouth, a governor of the Marine Biological Association, has generously given a sum of £500 to be spent on investigations on the bait question, and the Council have instructed me, as Director of the Association, to consider the best means of spending this sum. I shall therefore be glad to receive any suggestions from gentlemen who may interest themselves in this question, or to consider the work of any investigator already in the field, with the view of employing a suitable person to carry out a series of observations and experiments.

Two methods appear to offer a solution to the question. Either the animals used commonly as bait, such as whelks, mussels, and squid, may be reared artificially and kept in confinement till required, or some artificial bait may be invented which will lure the more valuable kinds of fish to the hook.

The former of these methods has been successfully practised in France, but such is the operation of the English laws on shore fisheries that there is very little prospect of its being possible in England, unless those laws are altered.

The second method, though more apparently difficult, is the more likely to attain success. Fish are undoubtedly guided by smell and taste in the selection of their food. Some are known to be very nice about the kind of food offered to them, and will only take certain kinds of bait. The whelk is a very favourite morsel, and has a distinct smell and taste: it may be possible to determine by analysis the essential oil or whatever it may be that gives this odour, and to imitate it sufficiently well to deceive the fish. The trade is able to imitate successfully the bouquet of wines: cannot chemistry produce an imitation of the bouquet of the whelk? G. C. BOURNE.

The Laboratory, Citadel Hill, Plymouth, July 31.

Geometric Meaning of Differential Equations.

IN the Proceedings of the Royal Asiatic Society of Bengal, 1888, p. 76, Prof. Asutosh Mukhopadhyay has proposed a really excellent mode of geometric interpretation of differential equations in general: viz. writing the equation in form F = 0, the geometric meaning of the symbol F considered as a magnitude (angle, line, area, &c.), *in any curve whatever* (wherein F is of course not zero), is, if possible, to be formed; then the geometric meaning of that equation obviously is that the quantity F vanishes right round every curve of the family represented. This is the most direct geometrical interpretation yet proposed.