supervision is essential. Nevertheless, it is necessary that the engineer should be able to make accurate calculations, and in this work problems hitherto considered almost indeterminate have been successfully tackled. For example, one chapter—vi.—is devoted entirely to the determination of the direct loads on columns, a matter of some difficulty, since the loading may be distributed very unequally over the supported continuous floors; complete mathematical analyses of beams under various conditions of loading and fixing are given in Appendix i.

The resistance of beams to shear is investigated in chapter viii., and the considerations which guide a designer are fully discussed. Engineers and architects who specialise in this branch of constructional work will find this book of great service, because the authors have not shirked the difficulties which face the designer of reinforced concrete structures, nor have they attempted to simplify calculations by neglecting important factors. T. H. B.

Handwörterbuch der Naturwissenschaften. Herausgegeben von E. Korschelt, G. Linck, and others. Erste Lieferung (enthaltend Bogen 1–10 des 1 Bandes)—Abbau-Algen. Pp. 160. (Jena: Gustav Fischer, 1912.) Price 2.50 marks.

THIS encyclopædia, of which we now review the first part, is of a very comprehensive character, embracing botany, chemistry, geology, mineralogy, physics, physiology and zoology, and other natural sciences. More than 300 authors collaborate in the work; the list of these, given on the covers of this part, although mainly consisting of German names, includes also representative workers in special branches in England, the United States, Italy, Russia, and other countries. A special editor takes charge of each of the branches of science named above.

The articles are arranged alphabetically, the following being a list of the principal articles in part i., with the authors' names and number of pages covered. *Abbildungslehre,* 30, O. Lummer; *Absorption,* 20, K. Schaefer; *Aether,* 8, G. Reddelien; *Aggregatzustände,* 15, R. Marc and F. Noell; *Aldehyde,* 12, G. Reddelien; *Algen,* 40 (uncompleted). This summary will serve to show the general scope and character of the work. The articles are authoritatively written by specialists and admirably illustrated; to each is appended a very useful bibliography.

Numerous short biographical sketches of representative men of science are included; for instance, in this number, E. Abbe, R. Abegg, M. Adenson, Agardh, Agassiz, Agricola, Sir G. Airy, Albertus Magnus, Aldrovandi, and d'Alembert.

Such a book of reference should prove an extremely useful addition to the library of every scientific worker, not merely as regards the actual information imparted in the text, but as a ready reference to the more special literature of each subject. The work will be completed in about 80 numbers, to be issued in the course of three to four years, forming in all ten volumes.

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.*]

Experiments with Kathode Rays.

DURING a research which is being carried out in conjunction with my colleague, Prof. Norman Collie, two experiments have been made the results of which are of some interest. Sir James Mackenzie Davidson was so kind as to furnish us with four deeply stained X-ray bulbs, which had been long in use, and had been rejected. These bulbs were broken up, the stained glass was placed in a combustion-tube connected with a Töpler pump, and any adhering air was displaced by frequent washing-out with pure oxygen, admitted for the purpose. The tube was then heated to bright redness; and the gas collected was placed in communication with a small bulb of cooled charcoal, in order to condense out all gases except hydrogen, helium, and neon. The residual gas was run up into a capillary tube, in which its spectrum could be examined. The spectrum was mainly that of helium, but there was a trace of neon.

The second experiment consisted in exposing some calcium fluoride, prepared by precipitation, washing, and heating to bright redness, to the continued action of kathode rays. The surface turns purple, and silicon fluoride, oxygen, and carbon monoxide are evolved. In order to maintain the vacuum best suited for kathode rays, a little oxygen was admitted from time to time. The gases evolved during some days' bombardment were rejected, to make sure that no adhering gases were collected in the final experiment. These gases were pumped off four times; the fifth quantity of gas was examined. After absorption of condensable gases, the residue consisted of pure neon, without a trace of helium.

From these experiments it would appear that not merely atoms of helium in rapid motion are capable of communicating sufficient energy to molecules and atoms on which they impinge to cause them to disintegrate, but that electrons in motion, in the form of kathode rays, can be made to play a similar part.

WILLIAM RAMSAY.

University College, London, July 16.

Merlia normani and its Relation to Certain Palæozoic Fossils.

RECENTLY I sent you a short communication (June 6, p. 353) on *Merlia normani,* the siliceous sponge with a supplementary calcareous skeleton, stating that it was of a double nature, and consisted of a sponge living in symbiosis with a chlorophyll-containing organism. Further, I stated that the name *Merlia normani* would have to be applied to the latter. I am glad to find, however, that this transfer of the name is not necessary, and that the sponge will continue to be called *Merlia normani.*

The discovery of the solution of the problem of Merlia is destined to prove of profound importance to palæontologists. For I now have convincing proofs —including, amongst others, the presence of siliceous spicules—that numerous Palæozoic fossils coming under the old-fashioned term "Monticulipora" are of essentially the same nature as Merlia, and that they are the supplementary calcareous skeletons of siliceous sponges. Merlia seems to be a solitary survivor of the Monticulipora type from Palæozoic times, though, of course, it may have acquired