

organisms as is desirable for the domestic science student. It is divided into five sections, dealing respectively with (a) morphology and classification; (b) cultivation and methods of investigation; (c) physiology; (d) fermentation; and (e) micro-organisms in relation to health and disease. The bacteria, yeasts, and moulds are considered at some length, and a chapter on parasitic Protozoa is included.

The chapters on general morphology and classification are particularly good, and a clear account is furnished of the distinguishing features of the various groups. In an appendix an illustrated key is given of the families and genera of the common moulds; this will be found most useful in the laboratory by other than domestic science students.

The brief description of the optics of the immersion system of lenses is correct, so far as it goes, but a paragraph should have been inserted pointing out that the great advantage of this system is the increased resolution obtained thereby.

The chapter on food preservation is a useful summary of the subject, but might have been extended with advantage.

The chapters on the nitrogen cycle in nature, alcoholic and other fermentations, enzyme action, and the ripening of certain foods are all satisfactory and convey a considerable amount of coordinated information on these important aspects of microbiology.

Much space (140 pages) is devoted to a consideration of disease and disease-producing micro-organisms, vegetable and protozoal. We think this section could have been somewhat curtailed with advantage, having regard to the avowed limitation of the book; and the space so gained might then have been devoted to a fuller consideration of certain aspects of household microbiology. Such criticisms as have been offered are those of detail, but the book as a whole is an excellent one. It is profusely and well illustrated, and can be strongly recommended not only to the domestic science student, but to a wider public.

R. T. HEWLETT.

*Aus Süd-Brasilien. Erinnerungen und Aufzeichnungen.* By Dr. W. Breitenbach. Pp xvi+251. (Brackwede i. W.: Dr. W. Breitenbach, 1913.) Price 3 marks.

THE author has lived in southern Brazil for several years in order to observe the land and the people, especially the German colonies, and beginning in the year 1884, he has since described his observations in more than thirty newspaper articles, essays, and separate pamphlets. Considering the changes which have come about in Brazil within the last thirty years, this book does not pretend to deal with present-day questions of commerce, industry, and general development, or with the colonisation scheme, which, of course, has undergone complete modifications. His personal experiences, narratives of various journeys, are also omitted, having been described elsewhere. It is, therefore, not very obvious why these "reminiscences and notes" should be published now.

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The fragmentary chapters on minerals, fauna, and flora are poor. Others, written in the easy, fluent style of feuilletons or causeries, deal with the life in towns, chiefly Porto Alegre, the capital of South Brazilian Germans, whose customs, modes of assimilation, ideals, and successes are compared with those of the Brazilians.

#### LETTERS TO THE EDITOR.

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#### Branch Product in Actinium C.

It is now well established that the atoms of radium C and thorium C can break up in two distinct ways, i.e., with the expulsion of either an  $\alpha$  or a  $\beta$  particle. It is to be expected from the close analogy between the C products of the various radio-active families that actinium C should also show abnormal disintegration, and, further, it might be anticipated that one of the branch products would emit an  $\alpha$  particle with great velocity and corresponding long range. We have made experiments to test this point. A source of actinium active deposit was covered with a sheet of mica equivalent to about 5 cm. air in stopping power of  $\alpha$  particles, and the whole placed in an exhausted chamber with a zinc sulphide screen about 2 cm. from the source. The numbers of scintillations appearing on the screen per minute for different pressures of the air inside the apparatus were counted, and thus the falling off of the  $\alpha$  particles with "range" determined. The results showed that in addition to the  $\alpha$  particles of actinium C with range 5.4 cm., a small number, about 1 in 600, can penetrate as far as about 6.45 cm. Special experiments showed that the long-range  $\alpha$  particles could not be due to radium or thorium impurity, and they must therefore be attributed to the expected new branch product.

In connection with this question, it should be noticed that Mme. Blanquies, in 1910, inferred the existence of two  $\alpha$ -ray products in the active deposit of actinium from the shape of the Bragg ionisation curve. The small fraction of long-range  $\alpha$  particles found in our experiments, viz., 1 in 600, is, however, quite insufficient to be reconciled with her results. We are therefore repeating her experiments.

E. MARSDEN.

R. H. WILSON.

University of Manchester, September 3.

#### The Terrestrial Distribution of the Radio-elements and the Origin of the Earth.

IN NATURE of June 19 and August 7, 1913, Mr. Holmes, in two interesting letters, shows on the basis of the planetesimal hypothesis how a concentration of the radio-elements might possibly take place in the earth's crust with their absence at depth to satisfactorily account for the observed temperature gradient of the earth; and in his latest communication he indicates how the inhibition of radio-activity by pressure might bring about the same result. But the terrestrial distribution of these elements seems to be of further importance in that it may enable us to determine whether our earth had a stellar or a planetesimal origin.

On the stellar hypothesis, the earth would be partly developed by a process of oxidation—practically the same as that by which we manufacture steel from