so little mention is made of metallurgical methods of assaying, which are frequently employed, not only for estimating silver and gold, but in the technical analysis of lead and copper ores. J. B. C.

Recueil de Données numériques. Optique. By H. Dufet. Part iii. Pp. 787–1313. (Paris: Gauthier-Villars, 1900.)

THE second part of this invaluable collection of physical and chemical data dealt with the optical properties of solids, and has already been described in these columns (vol. lx. p. 28). The present (and concluding) volume contains tables showing the rotatory powers of crystalline bodies, liquids and solutions, interference colours produced when rays of white light strike normally upon a layer of air of a given thickness, and supplementary tables of refractive indices, standard wavelengths, optical properties of inorganic and organic bodies, and other data. In all cases full reference is given to the authority for the values tabulated. The Physical Society of France has done a service to science by arranging for the preparation and publication of these results, which have been gathered from many sources, and are frequently difficult of access.

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.]*

Apatite in Ceylon.

A PARAGRAPH in Prof. Miers' interesting notice (NATURE, March 7) of the results of Dr. Grünling's mineralogical expedition to Ceylon may convey the impression that Dr. Grünling was the first person to recognise, and Dr. Schiffer the first to analyse, the sky-blue apatite of Ceylon.

Now Mr. H. Willett, of Brighton, handed me several years ago a beautiful transparent specimen which I at once identified as apatite though its colour was unusual. The sky-blue, prismatically developed crystals were embedded in a white dolomitic matrix. This specimen had been brought from Ceylon by Mrs. Willett. Its exact provenance was unknown, but some spot not far from Kandy and the railway thither was suggested as the probable locality. There can be little doubt that this specimen came from the neighbourhood of Wattegama, between Kandy and Matale, where Dr. Grünling obtained the apatite analysed by Dr. Schiffer. In the *Mineralogical Magazine* for April 1899 (p. ix) will be found a notice of a paper read by me before the Mineralogical Society on January 31, 1899, just two years ago, entitled "Analyses of Ceylon Apatite." Following this title occurs the paragraph: "Prof. Church exhibited blue apatites from Ceylon, one containing as much as 3·21 per cent. of chlorine, others only 0·63 and 0·34 per cent." The last of these three figures represents the percentage of chlorine found by me in Mr. Willett's specimen.

In discussing, in the autumn of 1898, the question of Ceylon apatite with Prof. Judd and Mr. F. W. Rudler, I found that the identification of this mineral did not seem at that time to have been published. Prof. Judd was good enough to supply me with specimens from another Ceylon locality (near Newara Eliya) and having a different matrix. Here the colour of the apatite was paler and its crystalline habit indistinct. This sample gave 0·63 per cent. of chlorine.

But by far the most interesting specimens were some imperfect tabular crystals sent to me in 1898 by a gem-merchant of Colombo. These were of a much richer blue colour than any of the other examples. Indeed, my Colombo friend's attention had been drawn to them by one of his "Moormen" having brought to him, some time previously, a perfectly transparent cut gem weighing five carats, which he offered as a blue spinel! I wrote for uncut specimens, which were soon procured from the same Moorman, but he had removed them from the matrix. The locality of these specimens proved to be Avisavelle. One of these crystals it was that gave me 3·21 as the percentage of chlorine. I may add that the dichroism of this variety closely resembled that of vivianite.

I would remark in conclusion that the number of Dr. Groth's *Zeitschrift für Krystallographie u. Mineralogie* in which the blue apatite of Ceylon is described was published last year, long after the notice of my paper had appeared in the *Mineralogical Magazine*. If any earlier communication on the subject has appeared I should welcome a reference to it.

A. H. CHURCH.

Maps in Theory and Practice.

EVERY advanced treatise on astronomy defines and explains certain kinds of map projection; but in all these accounts I have been struck with the absence of any notice of the particular kind of projection with which we are most familiar—the kind usually employed for representing the world in hemispheres; in fact, the commonest kind of map projection.

I have for the first time come across a notice of it, at p. 126 of the February number of the *American Journal of Science*, in the following terms:—

"The method of projection almost universally employed by geographers for representing hemispherical surfaces is the so-called globular projection, invented in 1660 by the Italian Nicolosi (Germain, 'Traité de Projections des Cartes Géographiques,' Paris, about 1865). The equator is divided into equal parts, and the meridians are circular arcs uniting these points with the poles. The parallels are likewise circular arcs, dividing the extreme and central meridians into equal parts."

As three points suffice for determining a circle, this definition is complete for the mapping of a hemisphere extending from pole to pole. To apply it to a smaller portion of the earth's surface, let the hemisphere be so taken that this portion is centrally placed between east and west; then the central meridian will be straight.

As it is desirable that theory should be kept in touch with practice, I would commend this subject to the attention of teachers of geography and astronomy. J. D. EVERETT.

11 Leopold Road, Ealing, W., March 11.

Early Observations of Volcanic Phenomena in Auvergne and Ireland.

MR. G. P. SCROPE ("Extinct Volcanos of Central France," ed. 2, 1858, p. 30) describes how Guettard and Malesherbes, returning from Italy, met Faujas de St. Fond at Montélimar in 1751, and, in his company, founded the theory of the volcanic origin of the mountains in the Vivarais. Guettard and Malesherbes thence proceeded to Auvergne, where M. Ozy, a chemist of Clermont-Ferrand, acted as their guide. Ozy knew his ground well, and had already observed the general aspect of the rocks, since Guettard (Mém. Acad. roy. des Sciences, 1752, p. 37) says that he "m'assura . . . que je trouverois par-tout une même structure & les mêmes matières qu'il m'avoua ingénument n'avoir jamais reconnues pour ce qu'elles étoient."

Sir A. Geikie has justly written of the discoveries of Guettard ("Anc. volcanoes of Gt. Britain," preface), "To France, which has led the way in so many departments of human inquiry, belongs the merit of having laid the foundations of the systematic study of ancient volcanoes."

Considerable interest, therefore, attaches to a letter from Ozy, published by Faujas de St. Fond in 1778 ("Recherches sur les volcans éteints du Vivarais," p. 434), and written in reply to inquiries as to what authors had first visited the volcanoes of Auvergne. Ozy refers somewhat casually to his meeting with Guettard, which was already well known through the information provided by him, and fully acknowledged in Guettard's paper. But he states that a year before, that is, in 1750, he was visited by "Olzendorff," an Englishman, and "M. Bowls, irlandois," who came to inspect the adjacent lead-mines. He continues: "Nous montâmes ensemble au *Puy de Dome*, & ce fut là que j'appris pour la première fois à connoître les *cratères*, les laves, &c., car auparavant je n'étois pas plus instruit sur cet objet que les autres habitans de cette province."

It seems hardly possible to construe this passage, written in answer to a direct inquiry from St. Fond, into a confusion of the two ascents. The "ensemble" refers to Olzendorff and Bowls; "la première fois" can hardly refer to events of the subsequent year. "Bowls," moreover, was, with high probability, William Bowles the mineralogist, who is known to have