

cessful performance of any given separation. The analysis of these conditions is one of the most admirable features of the book, complete explanations being given in all cases where the theory of the reactions is known (as in the separation of nickel and cobalt); conditions found to be necessary by experience, for which no theoretical reason can be given, are definitely stated to be empirical. One point emphasised here, to which no reference is made in our current text-books, has reference to the composition of the metallic sulphides obtained in the wet way. It is pointed out that the anhydrous sulphides as obtained in quantitative analysis differ considerably in their properties (colour, rate of oxidation) from the precipitates obtained in the ordinary course of qualitative work, and these differences of behaviour correspond to differences in composition. Thus the precipitates obtained with hydrogen and ammonium sulphides are in many cases hydrated sulphides  $R(SH)(OH)$  rather than  $RS$ . The anhydrous sulphides are occasionally formed in solution, and might give rise to confusion in certain cases. Thus, whilst the ordinary hydrated sulphide of manganese is yellow or flesh-coloured, in presence of an excess of ammonia and ammonium sulphide a green precipitate of anhydrous manganous sulphide is sometimes formed, especially from hot solutions. Again, the black precipitate obtained by treating cupric solutions with hydrogen sulphide is  $Cu_4S_3$ , and not  $CuS$ , as usually stated, the latter substance, according to Prof. Menshutkin, being unknown.

The analytical properties of the rarer metals are briefly treated in separate chapters. It would have added much to the scientific value of the book if this artificial distinction between ordinary and so-called "rare" metals could have been dispensed with. The present stereotyped mode of treatment is the chief cause of the want of knowledge by the average student of the properties and reactions of metals such as gold, platinum, cerium, uranium, and others that can only be conventionally considered as "rare."

The second half of the book deals with quantitative analysis. The descriptions are concise and the methods well chosen, but are hardly sufficiently detailed for the beginner.

#### OUR BOOK SHELF.

*Grundriss der Kristallographie für Studierende und zum Selbstunterricht.* By Gottlob Linck. Pp. vi + 252, 482 figures, and 2 plates. (Jena: Gustav Fischer, 1896.)

THIS book makes no pretence at supplanting such well-known works as those of Groth and Liebisch, but is intended for the less advanced student, and more especially for the chemist, to whom the necessity of some knowledge of crystallography is becoming increasingly felt. Except in one important particular, little attempt is made to break away from old methods of treatment. The thirty-two classes of symmetry are not treated as independent, but crystal symmetry is distributed in the usual way into the six systems, and under each system are described the holohedral, hemihedral and tetartohedral forms. Both the Naumann and the Millerian symbols for the faces are used, but greater prominence is given to the former.

An important innovation, however, is made in the chapter on the optical characters of crystals. Here, we

are glad to see, the author has followed the example of Prof. Groth and adopted the purely geometrical treatment involving the use of the "Optical Indicatrix," as devised by Mr. Fletcher.

The book is fairly evenly divided between the two sections dealing respectively with the geometrical and the physical characters of crystals, about a hundred pages being devoted to each. As it is not written for the advanced student, the subject of the calculation and graphic representation of crystals is not touched upon.

The book appears to be well adapted to the purpose for which it is intended. G. T. P.

*Cyanide Processes.* By E. B. Wilson, E.M. Pp. 116 (New York: John Wiley and Sons. London: Chapman and Hall, Ltd., 1896.)

IT is difficult to say with what object this little book has been written, and so it would perhaps be rash to assert that its object has not been attained. It is, at any rate, to be regretted that Mr. Wilson's work ever saw the light, as it is distinctly inferior to each of the half-dozen accounts which have already appeared of the cyanide process for the extraction of gold from its ores, and can only mislead and confuse those who expect to learn something from it. It is evident, from his own statements in the preface and elsewhere, that the author has derived much of his acquaintance with the subject from Patent Office literature, although he also claims to have read extracts from technical journals and other periodicals. He has not touched on mechanical details, but has confined himself to expounding the chemical principles of the process, which he appears to understand very imperfectly. The book is full of mistakes, such, for example, as that "the standard solution of cyanide contains from 0.5 to 1.5 per cent.," and that mercury oxidises quickly in the air at ordinary temperatures. On p. 74 it is stated that "the gold positive dissolves in the cyanide solution negative, with the result that the gold cyanide solution is positive. . . . Whether this electrolyte becomes converted into an electrode by absorbing the gold we are unable to say, but when they become 'cations' the gold is in the metallic state and the potassium cyanide is immediately set free." The book is well supplied with such statements as this. T. K. ROSE.

*The Treatment of Phthisis.* By Dr. Arthur Ransome, M.A., F.R.S. Pp. viii + 237. (London: Smith, Elder, and Co., 1896.)

MEDICAL men will be grateful for this treatise on the treatment of phthisical patients. The first part of the work comprises a general statement on the etiology pathology of phthisis, and the limits of infection; while the second part deals with the special and medicinal treatment of the malady. The contents are largely confined to descriptions of methods of treatment which have been personally used by the author, and results which have come under his own experience; but they, nevertheless, constitute a broad account of the nature and means of combating phthisis, and one which will give physicians brighter views as to the possibility of cure in the disease.

*A Text-book of Applied Mechanics.* Vol. I. By Alexander Jamieson, M.I.C.E., Professor of Electric Engineering in the Glasgow and West of Scotland Technical College, &c. Pp. 416. (London: Charles Griffin and Co., 1895.)

THE influence of Rankine is apparent here; the ground covered is much the same as in Rankine's "Applied Mechanics," but the treatment is more elementary, and the illustrative exercises and diagrams of a modern character.

If our writers of elementary school books on Mechanics, all copied from each other and almost exactly alike, could be persuaded to lift their eyes from their own pages and look elsewhere for novelty and reality, they would derive some profit from a treatise such as this. G.