

made to furnish theoretical explanations of the various analytical reactions. A few practical details may be quoted as illustrating modern tendencies in laboratory practice. The difficulty of separating nickel and cobalt is overcome by using dimethylglyoxime to precipitate the former metal, whilst the latter is identified in an ethereal extract with ammonium thiocyanate. There is a reversion to an old process in the removal of phosphoric acid from the precipitable metals by means of tin and nitric acid. Absolute alcohol is used to remove calcium nitrate from the mixed nitrates of the alkaline earths.

G. T. M.

THE FLOW OF SUBTERRANEAN WATERS.

Le Principe du Mouvement des Eaux Souterraines.

By J. Versluys. Traduit du hollandais par F. Dassel. Pp. 147. (Amsterdam: W. Versluys, 1912.) Price 7 francs.

CALCULATIONS concerning the flow of subterranean water have almost invariably hitherto been based upon the classical law of Darcy, published in 1856—a law which states that the quantity discharged is directly proportional to the head, and inversely proportional to the thickness of the stratum traversed. The terms are simple, and, for general purposes, are sufficiently close approximations to the truth.

It has been demonstrated more than once that the "law" is not absolutely exact, and, in several cases, the divergency from experimental results has been considerable. The law, in fact, has manifest limitations. Darcy omits all reference to temperature, and, indeed, it is doubtful whether he was acquainted with the experiments of Poiseuille, although these had been published ten years earlier, in 1846. The results obtained by Poiseuille led that investigator to conclude that the mean velocity of the fluid depended, in part, on its specific gravity and also on the temperature.

The object of the author of the brochure before us has been to review the situation in the light of recent research, as exemplified by the work of King, Richert, and others. He investigates, in the first instance, the purely theoretical problem of water-flow in its most general form. Then the various numerical results published in the literature of the subject are collated in a form suitable for comparison with the calculated results, and where pronounced divergences occur, observations and explanations are furnished. Finally, for strictly practical purposes, the author gives a series of numerical coefficients for use in cases where merely general approximations will serve.

The book consists of thirteen chapters and is a most painstaking and valuable compilation of the data at present available on the subject.

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OUR BOOKSHELF.

Das Relativitätsprinzip. Zweite vermehrte Auflage. By Dr. M. Laue. Pp. xii+272. (Braunschweig: F. Vieweg und Sohn, 1913.) Price 8 marks.

THE second edition of Prof. M. Laue's book on relativity, though on the same plan as the first edition of 1911, contains several additions. In chapter ii. a short discussion of a second arrangement of the Röntgen-Eichenwald experiments is inserted. The kinematic part of the theory of relativity, chapter iii., shows some slight explanatory extensions in § 6, and an enlarged discussion of the inadmissibility of propagation of any physical effects with a velocity exceeding that of light (§ 7). The "cause and effect" point of view here adopted, which leads to a rejection of any hypervelocity of propagation, seems somewhat too narrow. At any rate, it prevented the author from considering the admirable researches on relativistically rigid bodies of M. Born, and especially of Herglotz. In § 8 we remark a fuller exposition and illustration of the notion of "proper time."

In chapter iv. the vector product of two six-vectors and the four-dimensional "Gauss theorem" are inserted. Chapter v. contains, besides a few minor additions, a considerably extended treatment of the theory of the Trouton and Noble experiment, and a much amplified exposition of four-dimensional potential-theory, following the lines of a paper by Sommerfeld. Chap. vi. contains but a few new lines (on pp. 148-164), while vii. (Dynamics) contains many changes and ample additions, viz., Minkowski's dynamics of a point-mass, remarks on the foundations of the dynamics of continuous bodies (§ 27), and the rotational momentum, with a pair of instructive examples, several minor additions in the following paragraphs, and finally the chief addition to the first edition, namely, relativistic hydrodynamics, giving the general equations of motion, and treating the interesting special case of fluids "of smallest compressibility," both essentially on the lines of a paper by Dr. E. Lamla (*Ann. d. Phys.*, vol. xxxvii., p. 772, 1912).

The Dictionary of Entomology. By N. K. Jardine.

Pp. ix+259. (London: West, Newman and Co.) Price 6s. net.

THIS useful compilation is a glossary of the technical terms used in describing the structure of insects throughout their several stages. Within the limits which the author has imposed on himself it is likely to be of much service to students of entomology. These limits, it is true, are somewhat narrow; there is no mention of individual species of insects, or of genera or families. The orders, when given, are defined in the briefest possible manner, and frequently there is no indication of the insects comprised in them. The words "Coleoptera" and "Lepidoptera" find a place, but there is no mention of Dermaptera, Odonata, Homoptera, or Heteroptera. Hemiptera and Neuroptera are given, but beyond a bare defini-