and is abundant in embryonic tissues ; its exact rôle cannot be defined. The relation of the element sodium to the organism is most problematical ; it may exert a stimulating effect upon protoplasm, or its presence in the substratum may facilitate beneficial chemical changes. It does not enter into the composition of the plant in appreciable quantity however. The bulletin does not give adequate treatment to the pure mechanical functions of salts in the maintenance of turgidity, and it might have gained in value to the agricultural experimenter by the delineation of lines of practical investigation to be followed. It is highly controversial in parts and one is impressed with the very great differences of conclusions which may be reached from a consideration of the same facts by a comparison with the sections of Pfeffer's Plant Physiology or any other publication treating the same subject.

D. T. MacDougal.

Science Sketches: Chemistry its Evolution and Achievements. By FERDINAND G. WIECHMANN, PhD. New York, William R. Jenkins. 1899. Pp. vii + 176.

The study of the evolution of chemical science from its earliest beginnings possesses a fascinating interest. The author of this little book has endeavored so to present the subject as to make it useful to all who take a general interest in science. In matters which pertain to the development of chemistry before the nineteenth century the treatment is satisfactory. For the present century the book does not altogether succeed in tracing the *evolution* of the science. It seems rather to give a series of more or less isolated facts about the growth of chemical knowledge than to give a clear picture of the development of the science. Perhaps this should not be too severely criticised, for it is immensely difficult to give such a picture for the period in question.

If the theory that diamonds are extra-terrestrial in origin has actually been proposed by any one as suggested on p. 117, it must have arisen from a curious confusion as to Moissan's thought in the matter. Moissan says that in discovering the diamonds in the meteorites he has 'caught nature in the act,' meaning, not that the diamonds were in the meteorites as they flew through space, but that they were formed during the passage of the meteorite through the air and its subsequent cooling. This thought seems to have guided Moissan in his successful production of diamonds.

In the discussion of liquid air the failure to mention the pioneers Cailletet and Pictet is remarkable. Some reference should also have been made to the Linde machines by which liquid air is now produced in quantity on essentially the same principle as that used by Tripler.

W. A. NOYES.

BOOKS RECEIVED.

Scientific Papers. PETER GUTHRIE TAIT. Cambridge, The University Press. 1900. Vol. II. Pp. 500.

Railroad Construction, Theory and Practice. WALTER LORING WEBB. New York, John Wiley & Sons; London, Chapman & Hull, Ltd. 1900. Pp. x + 456.

Introduction to Science. ALEXANDER HILL. London, J. M. Dent & Co. Pp. 140.

SCIENTIFIC JOURNALS AND ARTICLES.

THE April number (Vol. I., No. 2) of the *Transactions* of the American Mathematical Society contains the following articles : 'On the metric geometry of the plane n-line,' by F. Morley; 'On relative motion,' by Alexander S. Chessin ; 'Plane cubics and irrational covariant cubics,' by Henry S. White; 'A purely geometric representation of all points in the projective plane,' by Julian Lowell Coolidge ; 'The decomposition of the general collineation of space into three skew reflections,' by Edwin B. Wilson ; 'A new method of determining the differential parameters and invariants of quadratic differential quantics,' by Heinrich Maschke; 'On the extension of Delaunay's method in the lunar theory to the general problem of planetary motion,' by G. W. Hill; 'On the types of linear partial differential equations of the second order in three independent variables which are unaltered by the transformations of a continuous group,' by J. E. Campbell.

THE May number of the *Bulletin* of the American Mathematical Society contains the following articles : 'On the geometry of the circle,' by Dr. Virgil Snyder ; 'Isomorphism between