proverbs, sayings and saws about the child in its various relations to the family; and the volume opens with three chapters replete with attractive examples of the child's tribute to its mother,— delightful exemplifications of the deep and holy impress which maternal love has left on the soul of the race.

Childhood is spoken of as the golden age of life, 'a moment of God,' 'a time of June,' its days as 'halcyon days,' a 'heaven on earth;' a belief, says the sanguine author, 'shared alike by primitive, savage and nineteenth century philosopher.' We wish, indeed, this were so; but, alas! our own observation is that out of a dozen persons asked, ten will tell you that the period of their childhood was by no means the happiest portion of their lives. In sad truth, the golden age of childhood is as much a popular delusion as the golden age of the world. We think of it as such merely because we forget the numberless little miseries which we then endured, and which at the time were grave and great to us.

But apart from this question of fact, about which the author's opinion in no wise injures the excellence of his labors, the thorough sympathy he has with children, their thoughts and doings, beautifies his pages and renders them charming reading as well as sovereignly instructive. He is no gleaner of dry stubble, but delights in the literary and poetic sides of his inquiry, and brings under contribution the bards, the dramatists and the moralists of the world. His reading has been wide, and not at second-hand, or through translations, but in the originals of a dozen tongues; as we might expect from one who has already made his mark as a comparative linguist.

A most useful bibliography of 549 titles and two ample indexes close his volume, and add vastly to its value to the serious student of folk-lore.

D. G. Brinton.

Practical Inorganic Chemistry. By G. S. Turpin. London and New York, Macmillan & Co. 1895. Pp. 158+viii.

This little book is evidently intended for the use of pupils in secondary schools. The first four chapters contain directions for weighing and measuring solids and liquids, for determining specific gravity, for measuring gases and observing their behavior under changes of temperature and pressure. The study of chemical action begins with an examination of the effect of air upon different metals. In these experiments the students find out that the balance is of very great service in interpreting the nature of chemical changes. The results of one experiment suggest the making of another experiment and so the work goes on step by step until the pupil finds it possible to separate the active and inactive constituents of the air and this leads him naturally to a determination of its volumetric composition. Oxygen and nitrogen are then studied more thoroughly and a quantitative analysis is made of potassium chlorate. Water and hydrogen are examined in a similarly thorough manner, and in connection with the latter the equivalent weights of a number of the metals are determined.

Only a few of the more common nonmetallic elements are dealt with. The chief merit of the book lies in this, that due attention is everywhere given to the quantitative side of chemical phenomena. It is shown how with very simple apparatus beginners can determine the relative quantities of substances that interact, and can acquire a knowledge of important laws of the science. The only criticism that might be made is that the apparatus and methods used in some of the quantitative work, as, for instance, in measuring gases by the volume of water displaced, are so very simple that by means of them only roughly approximate results can be obtained. An improvement in this direction would be made by collecting the gases in graduated gas measuring tubes, and correcting the gas volumes for the tension of aqueous vapor.

Taken altogether, the course of laboratory work here given is a most excellent one. It is refreshing to meet with a laboratory manual that is not simply a collection of qualitative tests for substances. This little book can be heartily recommended to all who are engaged in teaching elementary chemistry.

E. H. Keiser.

Chemical Experiments—General and Analytical. By R. P. Williams. Boston, Ginn & Co. 1895.

The author has arranged this course of chemical experiments for students in high schools, academies and colleges. In the first half of the book the usual experiments upon the preparation and properties of the non-metallic elements are given, while the latter half consists of a series of analytical tables giving the behavior of solutions of metallic salts under the influence of the various reagents. The laboratory directions in the first part are upon the whole clearly stated, but they are marred by the excessive use of abbreviations and formulas. For example, in experiment 34 the student is directed to "connect the flask with a large t. t. or with a rec. which contains no water, and from this t. t. or rec. have a d. t. leading to a p. t. so as to collect the gas over water." In the introduction, page xi., the students are instructed to keep notes in the following way: "I, ———, put the mixture into a t. t., adjusted a d. t., hung it to a r. s., and arranged so as to collect the gas in recs. over water in a p. t." Nearly everywhere in the book symbols are used instead of the names of substances. Surely to encourage pupils to imitate this example is to confirm them in slovenly habits.

Another feature of the book to which exception must be taken is that entirely too much attention is given to 'tests.' The main idea seems to be to give the 'tests' for each substance, and a pupil taking this course would most likely get the idea that practical chemistry consists in finding the 'tests' for various substances. There is not in the whole course a single experiment which serves to elucidate any one of the fundamental laws of the science.

Such a method of teaching chemistry to beginners cannot be recommended. Instead of teaching them to distinguish ferrocyanides from ferricyanides, tartrates from oxalates, it would be much better for them to study the chemistry of common things, of air, water and fire, and this study should not be confined to the qualitative side of the phenomena observed. It is not impossible to teach beginners how certain chemical changes can be studied quantitatively and to arrange a course of experiments for them so that they shall acquire some knowledge of the chief laws and principles of the science.

E. H. KEISER.

Einführung in die mathematische Behandlung der Naturwissenschaften. Kurzgefasstes Lehrbuch der Differential- und Integralrechnung mit besonderer Berüchsichtigung der Chemie. By W. NERNST and A. SCHÖNFLIES. München und Leipzig, E. Wolff. 1895. Pp. xi+309.

One of the authors of this book, W. Nernst, is professor of physical chemistry at the University of Göttingen; his collaborateur, Professor Schönflies, is attached to the department of mathematics at the same seat of learning. This union of forces has been a fortunate one, for the writers have certainly succeeded in carrying out their intention of facilitating the study of the higher mathematics for students of natural science.

The keynote of the authors' purpose is sounded in the following lines, which they introduce in their preface as a quotation from H. Jahn's recent publication on electro-chemistry: "Even chemists must gradually grow accustomed to the thought that theoretical chemistry will remain for them a book with seven seals, unless they shall have mastered the principles of higher mathematical analysis. A symbol of differentiation or integration must cease to be an unintelligible hieroglyphic for the chemist * * * if he would not expose himself to the danger of losing all understanding of the delopments of theoretical chemistry.

"For it is a fruitless endeavor to attempt, by lengthy descriptions, to elucidate—even partially—that, which an equation conveys to the initiated in a single line."

The opening chapter discusses the principles of analytic geometry. After a few introductory remarks on graphic methods of presenting experimental results, and after having referred to the axes of coördinates, abscissa and ordinate, quadrants, etc., loci and their equations are considered. The circle, the parabola, the straight line, the ellipse, receive due attention, examples and problems being given to illustrate the discussions.

The second chapter is devoted to the fundamental principles of differential calculus. The introductory paragraph of this chapter —on the principles of the higher mathematics and the methods of consideration employed in the natural sciences—is well worthy