tablishment and adequate maintenance of research schools at public expense would amply justify such a course, such promises do not stand alone, as research, to use the words of Lockyer quoted above, is the most powerful engine of education known.

The undertakings of communities, as is well understood, are formulated and guided by a comparatively few individuals who see not only the immediate and tangible ends to be gained, but the far-reaching influences that follow. It is from these few informally appointed directors of communities that I venture to ask for due recognition of the fundamental importance of research, both as a means for securing greater returns from commercial pursuits and higher educational training in our universities. When these truths are fully appreciated and clearly expressed by the leaders of communities, the keystone will be placed in the educational arches states have erected, and the continued advance of our country and the attainment of a still greater degree of human happiness be assured.

Israel C. Russell.
University of Michigan.

SCIENTIFIC BOOKS.

Grundlinien der anorganischen Chemie. Von Wilhelm Ostwald. Zweite, verbesserte Auflage. Leipzig, W. Engelmann. 1904. Pp. xx + 808.

The first edition of this book appeared in 1900, and in the course of three years the entire edition of four thousand copies was exhausted. In addition, translations into English and Russian have appeared which have also had a large sale. A translation into French is in course of preparation.

The second edition differs but very slightly from the first. The first half of the first chapter has been rearranged somewhat to secure a clearer presentation of general fundamental conceptions; but aside from this, practically nothing has been done except to correct minor errors appearing in the first edition.

The general plan of arrangement and treatment of the subject matter of this book was sufficiently elucidated in the pages of Science when the first edition appeared. The new departure represented by this treatise consists in an attempt to incorporate systematically the conception of mass action, the phase rule and, in general, the hitherto much neglected influence of temperature, pressure and concentration, as vital factors in determining the progress of chemical reactions. This feature of the treatise together with the constant endeavor of the author to develop ideas inductively and to connect with the substances studied their various important physical and physiological as well as chemical properties, constitutes the valuable, if not the epoch-making part of the book and justifies the remarkable sale of the first edition, which clearly indicates that chemists generally have gladly embraced the opportunity afforded to become acquainted with this new method of presenting elementary chemistry.

On the other hand, the introduction of the 'ions' as a purely chemical conception is unfortunate. While there might possibly have been a justification to thus introduce this conception at the time the first edition was written, the unqualified retention of this notion in the second edition can not be justified; for, since the appearance of the first edition, it has been demonstrated that instantaneous chemical reactions occur in the best of insulators exactly as they do in electrolytes. The use of the term ion in the 'purely chemical' sense as it appears in this book must now be considered merely as a mode of speaking, the term signifying only what has hitherto been expressed by the word radical.

The descriptive part of this book is not unlike that of other books of similar scope, except for an additional remark here and there about ions of this or that kind. Indeed, in most instances Ostwald writes reactions as they have always been written, without using the ionic notation; in so doing he virtually admits that it is not feasible to apply the ionic conceptions logically in most cases. Such an attempt would, indeed, often lead to grotesque distortions rather than to a simple mode of expression which every one could understand.

The weak part of the treatise, then, consists in the undue magnification of the importance of the analogy between gases and solutions and the unsuccessful attempt to make the ionic conception the basis of explaining chemical reactions. To eradicate these undesirable features will necessarily cause a somewhat profound change in the character of the book. The author has everywhere deliberately chosen to entirely omit 'in the interests of the student' a consideration of opinions which conflict with his own. This course can hardly be justified by the additional care which, it is stated in the preface, was exercised in the choice and exposition of the ideas presented, and will only make it all the more difficult to introduce the changes which sooner or later must be made in future editions of the book if it is to continue to be of real value.

LOUIS KAHLENBERG.

SOCIETIES AND ACADEMIES.

THE SAN FRANCISCO SECTION OF THE AMERICAN MATHEMATICAL SOCIETY.

THE fifth regular meeting of the San Francisco Section of the American Mathematical Society was held at Stanford University on April 30, 1904. Twelve members of the society were present. A morning and an afternoon session were held. Both these sessions were attended by a number of local teachers of mathematics who are not members of the society. The following papers were read:

PROFESSOR M. W. HASKELL: 'The construction of conics satisfying given conditions.'

PROFESSOR H. C. MORENO: 'On a class of ruled loci.'

DR. D. N. LEHMER: 'On a cylinder the intersection of which with a sphere will develop into an ellipse.'

MR. A. W. WHITNEY: 'The application of actuarial methods to fire insurance.'

PROFESSOR R. E. ALLARDICE: 'On the envelope of the directrices of a system of similar conics through three points.'

PROFESSOR IRVING STRINGHAM: 'Analytical treatment of certain metrical relations in the non-euclidean plane.'

PROFESSOR G. A. MILLER: 'Addition to a theorem due to Frobenius.'

PROFESSOR H. F. BLICHFELDT: 'A theorem concerning the invariants of linear homogeneous groups with some application to substitution groups.'

PROFESSOR H. F. BLICHFELDT: 'The linear homogeneous groups in four variables.'

PROFESSOR M. W. HASKELL: 'Triangles in perspective and the collineations derived therefrom.'

PROFESSOR M. W. HASKELL: 'The construction of a twisted cubic from six points.'

In the absence of Mr. Whitney his paper was read by Professor Stringham. The next meeting of the section will be held at California University on October 1, 1904.

G. A. MILLER,
Secretary.

MINNESOTA ACADEMY OF SCIENCES.

THE meeting of the academy was held in the geological lecture room of the University of Minnesota, on April 11, when the following paper was presented: 'The Gypsum Deposits of New York State,' by Mr. A. L. Parsons, instructor in geology in the University of Minnesota, illustrated by lantern slides.

Through the courtesy of Dr. Frederick J. H. Merrill, director of the New York State Museum, Mr. Parsons was enabled to present the results of his studies on the geology and economic importance of the gypsum deposits of New York before their publication as a state report. These deposits, which were among the first to be discovered and developed in this country, are in the rocks of the Salina age and are closely related to the salt deposits of the state. All the mines of importance are located in a shallow valley extending from Rome to Buffalo, and east of Rome the deposits, though of no commercial importance, are found on the south side of the Mohawk Valley as far east as Schoharie.

The formation of this valley occurred prior to the glacial epoch, and in the region between Syracuse and Rome it has been filled with several hundred feet of glacial and alluvial débris. The presence of this valley is explained by the wearing away of the soft Salina shales and soluble beds of salt and gypsum which lie between the harder limestones of the Niagara and Helderberg periods. With the development of the cement wall plaster and