SCIENCE

CONTENTS

SOME THOUGHTS ON MODERN MATHE-MATICAL RESEARCH [1]

MATHEMATICS has a large household and there are always rumors of prospective additions despite her age and her supposed austerity. Without aiming to give a complete list of the names of the members of this household we may recall here a few of the most prominent ones. Among those which antedate the beginning of the christian era are surveying, spherical astronomy, general mechanics and mathematical optics. Among the most thriving younger members are celestial mechanics, thermodynamics, mathematical electricity and molecular physics.

Usually a large household serves as one of the strongest incentives to activity, and mathematics has always responded heartily to this incentive. As the most efficient continued service calls for unusual force and ingenuity, mathematics has had to provide for her own development and proper nourishment in addition to providing as liberally as possible for her household. This double object must be kept prominently before our eyes if we would comprehend the present mathematical activities and tendencies.

There is another important incentive to mathematical activity which should be mentioned in this connection. Mathematics has been very hospitable to a large number of other sciences and as a consequence some of these sciences have become such frequent visitors that it is often difficult to distinguish them from the regular members of the household. Among these visitors are

[1] Read before the Illinois Chapter of the Society of the Sigma Xi, April, 1912.

there are in the jaws and of what kind they are, in recent forms and in a good many fossil forms, he will most likely find here a careful statement of the facts, which is after all the professed purpose of the book. Certain it is, however, that such odontographical information is merely the beginning and not the end of odontology, conceived as a division of comparative anatomy.

WILLIAM K. GREGORY

Modern Industrial Chemistry. From the German of H. BLÜCHER. Translation by J. P. MILLINGTON, M.A. (Cantab.), B.Sc. (Wales), formerly Scholar of Christ's College, Cambridge. The Gresham Publishing Co., 34 and 35 Southampton St., Strand, London. 1911.

According to the publisher's note, this volume is put forward as a standard work, now for the first time issued in an English translation, designed to cover the whole range of subjects with which the chemist and manufacturer are usually concerned. It is not intended as a text-book, but to occupy a position between the text-book and the lexicon. It is arranged in strictly alphabetical order and should therefore be regarded as a dictionary of chemistry.

It is conveniently issued in a single volume of 780 pages. With the exception of the convenience of having a compendium of this sort issued in a single volume, it is difficult to see in what respect this work presents any advantages over the standard dictionaries of chemistry such as those of Thorpe and Watts. It certainly can not be called up-to-date. Many of the leading industrial processes and products are not well handled, especially from the standpoint of American industry. The treatment of the chapter on industrial alcohol, for instance, is not in accordance with the best modern information, and the same may be said of the article on sugar manufacture. Under the descriptions of asphalts, petroleums, tars, etc., many of the statements seem arbitrary and misleading from the standpoint of American technology. The translator has evidently found considerable difficulty in finding synonyms for German technical names and phrases. The properties of both asphalts and tars, as related to their residual products, now so much used for paving purposes, are inadequately treated, and unimportant patented preparations seem to be given too much prominence. Water gas tars, for which considerable uses have been found, are not mentioned in the volume.

Under pigments and oils, we find a very fair but brief description of the various dry colors, mineral and artificial, as well as pigments used in the manufacture of paints. The treatment of the manufacture of white lead is, however, very old, and does not include any mention of the new processes now in use both in America and abroad, such, for instance, as the Rowley or the Picher processes. All of the more common oils and thinners for paints are briefly described, and considerable matter concerning the manufacture of varnishes is included. The newer paint oils which have come into prominence of late years are not mentioned.

Metallurgical processes are described only briefly, and for the most part the descriptions do not adhere to the usual or best practise common in American metallurgy.

Perhaps the most useful feature in the volume is comprised in the digest of foreign and local patents, which touch upon a number of the principal subjects cited and which afford considerable data for reference purposes. The book is well printed and presents an attractive appearance. It will undoubtedly be a valuable addition to a reference library for the chemist or manufacturer, but should not be accepted as authoritative or up-to-date in all the numerous subjects which are covered.

ALLERTON S. CUSHMAN

SCIENTIFIC JOURNALS AND ARTICLES

THE April number (volume 13, number 2) of the *Transactions of the American Mathematical Society* contains the following papers:

G. A. Bliss: "A generalization of Weierstrass's preparation theorem for a power series in several variables."

W. D. MacMillan: ''An existence theorem for periodic solutions.''

W. F. Osgood: ''A condition that a function in a projective space be rational.''

J. C. Fields: ''A method of proving certain theorems relating to rational functions which are adjoint to an algebraic equation for a given value of the independent variable.''

M. B. White: ''The dependence of focal points upon curvature for problems of the calculus of variations in space.''

J. E. Hodgson: ''Orthocentric properties of the plane directed n-line.''

S. E. Urner: ''Certain singularities of point transformations in space of three dimensions.''

J. R. Conner: ''Multiple correspondences determined by the rational plane quintic curve.''

THE March number (volume 18, number 6) of the *Bulletin of the American Mathematical Society* contains: Report of the winter meeting of the Chicago Section, by H. E. Slaught; '' An identical transformation of the elliptic element in the Weierstrass form,'' by F. H. Safford; '' Surfaces in hyperspace which have a tangent line with three-point contact passing through each point,'' by C. L. E. Moore; '' Note on mixed linear integral equations,'' by W. A. Hurwitz; '' Note on the graphical solutions of the fundamental equations in the short methods of determining orbits,'' by A. O. Leuschner and B. A. Bernstein; '' On a functional equation,'' by A. R. Schweitzer; '' Shop mathematics,'' by C. F. Warner with rejoinder by C. N. Haskins; '' Shorter Notices '': Dumont's Arithmétique générale, by N. J. Lennes; Schur's Grundlagen der Geometrie, by F. W. Owens; Appell and Dautheville's Introduction à l'Etude de la Physique et de la Mécanique appliquée, by J. B. Shaw; Crelier's Systèmes cinématiques, by Arnold Emch; '' Notes ''; '' New Publications.''

THE April number of the *Bulletin* contains: Report of the February meeting of the society, by F. N. Cole; '' On the foundations of the theory of linear integral equations,'' by E. H. Moore; '' Shorter Notices '': Young's Fundamental Concepts of Algebra and Geometry, by E. B. Lytle; Friedel's Leçons de Cristal-lographie, by J. B. Shaw; Andoyer's Nouvelles Tables trigonométriques fondamentales, by E. W. Brown; Annuaire du Bureau des Longitudes pour l'An 1912, by E. W. Brown; '' Notes ''; '' New Publications.''

SPECIAL ARTICLES

TERTIARY DEPOSITS OF EASTERN MEXICO

OUR investigations during the past year on the eastern coast of Mexico have brought out very important facts in connection with the historical geology of the Gulf Coast.

As stated in this journal a year ago,[1] deposits which are lithologically and faunally the same as those referred to the Eocene in the Texas Coastal Plain were traced southward through northeastern Mexico to the Conchos or Presas river. Fossils characteristic of substages of the Texas Claiborne were found on this river, and beyond it the sediments were traced southward to a point a few miles north of Abasola, where they passed from sight beneath the overlap of the San Fernando Oligocene. The materials of the Eocene throughout this region are clays and sands in all respects similar to those of the Texas area and the fossils are species practically identical with those of that region.

The materials of the Oligocene are yellow clays and sands with thin beds of impure limestone, carrying an abundant fauna. These beds are not represented at all in the Texas area between the Brazos and Rio Grande. If they were ever present they have been eroded or concealed by the overlap of later beds.

From the point north of Abasola, where the San Fernando is found resting upon the Papagallos shales of the Cretaceous, this contact continues southward along the eastern border of the valley of the Soto la Marina river to the town of the same name; then it parallels the eastern flank of the Tamaulipas range, drawing gradually nearer the Gulf shore until, in the vicinity of Tordo bay, the Cretaceous is found within 8 miles of the coast.

[1] SCIENCE, Vol. XXXIII., No. 841, pp. 232–234.