Internaciona matematikal Lexiko en Ido, Germana, Angla, Franca, e Italiana. By DR. LOUIS COUTURAT. Jena, Gustav Fischer, 1910. 4to. ii + 36 pp. M. 1.50.

WHETHER a universal language will ever be possible, and whether it will be a living tongue or an artificial construction, remains for the future to show. The fate of Volapük is still fresh in memory, and now the simple language of Esperanto is simplified still more in the new Ido. One may reflect that "le mieux est l'ennemi du bien"; what one considers simple another may not, and as soon as we begin to perfect, we begin to evolve a new thing. To be artificially universal a language must be fixed, crystallized. When one considers the inconsistent notations of mathematics itself and yet their persistence, he may take warning as to the attempt at faultless simplicity.

However, we have here a pamphlet of some thirty-six pages with five columns—Ido—Deutsch—English—Français—Italiano. The first is alphabetic and contains about 1300 words in the artificial tongue Ido. The other columns contain their equivalents. The list follows Müller's Vocabulaire closely, omitting archaic terms and those employed by a single author. The resemblance of the entire list to their French equivalents is rather striking, and one may ask whether after all, it would not be the simplest thing to adopt French as a universal tongue.

JAMES BYRNIE SHAW.

Anfangsgründe der Maxwellschen Theorie verknüpft mit der Elektronentheorie. Von FRANZ RICHARZ. Leipzig, B. G. Teubner, 1909. ix + 245 pp.

THE elements of the theory of the electromagnetic field are now so widely taught, and to so many pupils, that numerous teachers can indulge in the satisfaction of having their own text from which their pupils may get the viewpoint which seems most desirable for them. The literature of the subject therefore grows apace, and as it grows, there devolves upon each successive author the duty to write with some well defined aim rather than to attempt an exhaustive treatment. Apparently Richarz has clearly recognized this duty and privilege and has been successful in their execution. His book must therefore be welcome and advantageous to many teachers who wish to lay the theoretical foundations for the more important applications without being led astray into discussions which at

present are chiefly of but theoretic interest. The author uses the concept of vectors freely, but hardly any vector analysis. Contrary to the growing and now usual custom of employing a right-handed coordinate system for electromagnetism, he uses the left-handed system of the pure mathematician and astronomer.

In Chapter I the start is made directly from the concept of a field and the Maxwell equations are obtained from the Ampère-Faraday experimental laws. The second chapter reviews and expounds and extends the analysis from the point of view of ether and matter. The next chapter treats non-conductors and static phenomena, derives Coulomb's law, discusses free and true electricity and magnetism, all with admirable clearness and precision. Chapter IV brings forward the matter of conductors and conduction currents. Ohm's law and the loss of energy from ether to matter are taken up, but without the introduction of the Poynting vector, which would introduce greater complications than are desired. It should be especially remarked that the concept of a current as a flow of electrons is clearly presented, a thing not often ventured at this stage. A following chapter introduces the potential for conductors and insulators and discusses static or stationary phenomena.

To this point about half the book has been covered. Three long chapters on electromagnetism, induction, and high frequencies complete the work. Proceeding from the general equations of the electromagnetic field, the author introduces the vector potential for a linear conductor and from it he derives the Biot-Savart law for the action between current elements. Stokes's theorem, solid angle as a potential, the multiple value of the potential, and the question of work are mentioned. The mutual potential energy of two circuits and the forces between the circuits are treated with some detail. In much the same way, the work is carried on to induction, two notable features being the derivation of induction in ponderable matter from the point of view of electron theory and the exhibition of the mass of the electron as a phenomenon of self induction. From the fact that such matters are mentioned it appears clear how careful the author is to keep before his readers the latest physical meaning attached to the fundamental phenomena of electromagnetism. High frequency phenomena in dielectrics or conductors are connected with the velocity of light, the opacity of conductors, the coefficient of reflexion, and similar questions in electromagnetic optics.

Such a mere catalog of the important subjects touched upon

by the author may seem hardly a review; it does, however, when taken with the introductory remarks, give perhaps in the shortest space the best idea of a book of this nature where scope and presentation are the two features of most vital interest. The author certainly has written a good introduction to Maxwell's theory and has given appropriate attention to its relation to the later atomic view of electricity.

E. B. WILSON.

NOTES.

THE twenty-ninth regular meeting of the Chicago Section of the AMERICAN MATHEMATICAL SOCIETY will be held at the University of Chicago on Friday and Saturday, April 28–29. Titles and abstracts of papers to be presented at this meeting should be in the hands of the Secretary three weeks in advance of the meeting.

AT the meeting of the London mathematical society held on January 12 the following papers were read: By T. C. LEWIS, "A property of the number 7"; by H. M. MACDONALD, "A mode of representation of an electromagnetic field as due to singularities distributed over the surface"; by W. H. YOUNG, "On the fundamental theorem in the theory of functions of a complex variable"; by E. W. HOBSON, "On the fundamental theorem relating to the Fourier constants for given functions."

THE Paris academy of sciences announces the following prize subjects for the year 1912: The grand prize (3000 francs) for the improvement of the theory of algebraic differential equations of the second or of the third order the general integral of which is uniform. Also the problem mentioned in the BULLETIN, volume 16, page 332. This was proposed before, but no suitable memoirs were received. The Francoeur prize (1000 francs) for work useful to the propagation of pure and applied mathematics. The Poncelet prize (2000 francs) for a worthy memoir in pure mathematics. The Montyon prize (700 francs) for the improvement of machinery useful in agriculture. The Fourneyron prize (1000 francs) for the best contribution to the theory of aviation. A number of prizes in astronomy are announced, without close restriction of the subject.