

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

MR. W. E. THRIFT has been elected Erasmus Smith professor of natural and experimental philosophy in Trinity College, Dublin, in succession to the late Prof. G. F. Fitzgerald.

WE are glad to notice in the report of the committee of the Bristol Museum that interest in nature study is encouraged by various means. In one of the rooms of the Museum, three aquaria containing the ova of the common frog, and the common and crested newts, were arranged, in order that the various stages of development passed through by these forms might be seen by visitors. The aquaria proved of especial interest to young people from schools. Lectures have been given by Mr. H. Bolton, the curator, to the students of evening continuation schools, and the Museum has been visited by a number of classes from other schools. The committee record that definite steps have been taken to provide the additional accommodation that has long been needed. The proposal took the form of providing for museum extension in conjunction with the establishment of a municipal art gallery, and the generosity and public spirit of Sir William Henry Wills has made this possible. Upon the basis that the sum of about 30,000*l.* would be required to provide a suitable building for both purposes, Sir W. H. Wills offered that if 10,000*l.* were provided for museum extension on the site adjoining the present building, he would provide for the completion of the scheme. This munificent offer was accepted by the council, who also accepted a report of the joint libraries and museum committees recommending the requisite application to Parliament, and placing the administration of the proposed art gallery in the hands of the museum committee.

IN connection with the London School of Economics and Political Science, Lord Rosebery delivered an address on commercial education at the Mansion House on Thursday last. The Lord Mayor, in opening the proceedings, stated that the object of the school was to provide a scientific training in the structure and organisation of modern industry and commerce and the general causes and criteria of prosperity as they were illustrated or explained in the policy and the experience of the British Empire and foreign countries. Mr. Passmore Edwards had generously contributed 10,000*l.* towards the erection of a building for the faculty of economics and political science; and Lord Rothschild had given 5000*l.* In the course of his address, Lord Rosebery said: "From whatever standpoint we may regard the age, I think we must all be aware that we are coming to a time of stress and of competition for which it is necessary that we should be fully prepared. It is not necessary here to indicate what form that stress or that competition may take, but in military matters, in naval matters, in commercial matters, in educational matters, we see more clearly day by day that we shall not be allowed to rest on any reputation that we possess already, but that we shall have to fight for our own hand in every department of human activity and human industry if we wish to keep our place. It is necessary for a nation in these days to train itself by every available method to meet the stress and the competition which is before it. Lord Salisbury said the other day—and I think with some truth—that it was impossible to define technical education. Well, I do not think it is impossible, but I think it is difficult. The way in which I should define it—very imperfectly, I am aware—is this. I should define it as education having a direct practical bearing on any definite industry or calling; that is to say, an education, not as we are accustomed to see secondary education as carried out in this country—an education for the training and elevation of the mind—but a practical training having a business bearing." The United States Ambassador, in proposing a vote of thanks to the Lord Mayor, said there was no doubt that colleges of economics and of political science were the latest development in the theory and practice of that education which was to fit men for the great affairs of life as they were developing in the complex and rapidly varying phases of modern civilisation. In the United States they regarded them as among the chief means of maintaining their part in that rivalry which they were maintaining, and meant to maintain with all their force, with their sister nations of the world, and especially with this country, to which they were so much attached—a rivalry not of arms or of warfare, but a rivalry of brains, of skill, of courage in the great industries of life.

SCIENTIFIC SERIALS.

Transactions of the American Mathematical Society, vol. ii. No. 1.—Invariants of systems of linear differential equations, by E. J. Wilczynski. The author has elsewhere shown that the most general point-transformation, which converts a system of n homogeneous linear differential equations into another of the same form and order, is

$$x = f(\xi), y_k = \sum_{i=1}^n a_{ki}(\xi)\eta_i \dots (k=1, 2, \dots, n),$$

where $f(\xi)$ and $a_{ki}(\xi)$ are arbitrary functions of ξ , and the determinant $|a_{ki}(\xi)|$ does not vanish identically (*American Journal of Mathematics*, January 1901). In the present paper he considers those combinations of the coefficients of a system of linear differential equations which remain invariant when the system is transformed by the above transformation. These transformations form an infinite continuous group, and the author employs Lie's theory throughout, as Dr. Bouton has done in the *American Journal of Mathematics*, vol. xxi. No. 2. The applications of the theory are but lightly touched upon, and only a passing mention is made of covariants (p. 23) in this (first) paper.—Divergent and conditionally convergent series whose product is absolutely convergent, by Florian Cajori. Tests of the convergence of the product of conditionally convergent series have been worked out by Pringsheim, A. Voss and by Cajori (see *American Journal of Mathematics*, vol. xv. and vol. xviii., and *Bulletin of the American Mathematical Society*, vol. i. (1895)). Two typical examples are discussed and also the author's general method.—Sets of coincidence points on the non-singular cubics of a syzygetic sheaf, by M. B. Porter. The points where a cubic can have an eighth order contact with cubics of the syzygetic sheaf are called by Halphen coincidence points of the cubic. The author considers certain geometrical relations that subsist between an inflexion triangle and its associated group of in- and circumscribed rectilinear triangles. The number of these triangles is 24. We give one property. Each in-circumscribed triangle is in six ways perspective with its associated inflexion triangle.—Note on non-quaternion number systems, by W. M. Strong. All number systems have been divided into the quaternion and non-quaternion systems, and Scheffers has shown that the n fundamental units of a non-quaternion system may be so chosen that the multiplication table takes a particularly simple form, which is in turn characteristic of the non-quaternion systems. The present paper shows that the choice of the units may be so regulated that the multiplication table becomes still simpler.—On the reduction of the general Abelian integral, by J. C. Field, embodies results (in 38 pp.) which were presented at the annual meeting of the Society held in 1897. M. M. Appell and Goursat, in their "Théorie des fonctions algébriques et de leurs Intégrales" (pp. 344-345) give a brief sketch of Hermite's method for obtaining by rational operations the reduced form for a hyperelliptic integral, in which note they make a remark which seems to imply that the more general problem in the case of the Abelian integrals was still awaiting a solution. The present paper is the author's solution of the problem.—"Ueber flächen von constanter Gausscher Krümmung," by D. Hilbert. The greater part is concerned with Flächen von negativer and the rest with Flächen von positiver constanter Krümmung (cf. Dini, *Annali di Mat.* Bd. 4. 1870; Darboux, "Leçons sur la théorie générale des surfaces," Bd. 3, and Bianchi, "Lezioni di geometria differenziale").—A short note follows on the functions of the form $f(x) \equiv \phi(x) + a^1 x^{n-1} + a_2 x^{n-2} + \dots + a_n$ which in a given interval differ the least possible from zero, by H. F. Blichfeldt. This gives Tchebycheff's solution (from Bertrand, "Calcul différentiel," p. 512) and then the author's solution. As this gentleman has not had access to Tchebycheff's memoirs his method may not be altogether novel.

Annalen der Physik, March.—On the production and measurement of sinoidal currents, by Max Wien. The ideal electrical oscillations for use in wireless telegraphy would consist of a continuous, purely sinoidal current, the oscillation frequency of which could be varied slowly and continuously from a low figure up to frequencies that could be seen. The arrangement described in the present paper, although still far short of this, constitutes a considerable advance upon previous work, as a purely sinoidal current can be obtained with an oscillation frequency up to 8500 per second, and with a slight depar-