

existence of a demand for men competent to deal with machinery and familiar with all the lower forms of engineering, Sir A. Colvin proceeds to discuss what course the training should take, how best to secure it, and the sources from which the necessary funds could be obtained. With regard to the first point, he thinks that what would mostly be required are facilities for gaining a competent theoretical and practical knowledge of the more subordinate grades of mechanical engineering, such as is necessary to a foreman mechanic, more especially in connection with the steam-engine, the railway workshops, and the iron-foundry; and also of the processes of cotton-spinning as employed in the mills established in the North-West Provinces. "These are the two great branches of industry which in Bombay have been recognized as fields for native labour: which, though in a lesser degree, exist here (in the North-West Provinces), and in regard to which, at present, specialized means of instruction are unquestionably, in these provinces, wanting." With regard to the second point, there exists at Roorkee a Government Engineering College and Government workshops, and it seems probable that these will form the nucleus of the instruction necessary. As to the third point, Sir Auckland Colvin thinks it would be premature to enter into the question of funds until the dimensions of the scheme are definitely decided upon. Finally, to see how far all these views meet the industrial needs of the province, Sir Auckland has decided to seek the aid of a strong Committee, which will obtain from all available quarters information on the points indicated in the minute, deputing members to Calcutta, Bombay, and Madras, and subsequently reporting to Government the result of its inquiries, with its own recommendations, and with full details of any scheme which it may desire to see carried into effect.

#### UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—The judges for the Johnson Memorial Prize, 1891, have awarded the prize to Mr. M. S. Pembrey, B.A., Christ Church. The judges also select the essays of the following as worthy of mention: Mr. T. I. Pocock, Scholar of Corpus Christi College, and Mr. F. T. Howard, B.A., Balliol College. The Johnson Prize consists of a gold medal of the value of ten guineas, together with the surplus dividends on the money invested. The prize is awarded every fourth year to the candidate who produces the best essay on some subject connected with astronomy or meteorology. The selection of a subject is left to the discretion of the candidates. This year there were six candidates.

Mr. Pembrey was a Fell Exhibitioner of Christ Church, gained a first class in the final honour school of natural science in 1889 (physiology), and obtained the Radcliffe Travelling Fellowship in 1890. Mr. Pocock was placed in the first class of mathematical moderations and also in the final mathematical schools, Trinity term 1891. Mr. Howard was placed in the second class of the final honour school in natural science (geology), and obtained the Burdett-Coutts Scholarship in 1890.

#### SOCIETIES AND ACADEMIES.

##### LONDON.

Chemical Society, June 18.—Prof. A. Crum-Brown, F.R.S., President, in the chair.—The following papers were read:—A note on some new reactions of dehydracetic acid, by Dr. J. Norman Collie. In preparing dehydracetic acid, by passing ethyl aceto-acetate through a red-hot tube, it is stated that alcohol is formed; the author finds that large quantities of ethylene gas and acetone are also produced. Dehydracetic acid is also volatile to a considerable extent with steam, and is decomposed by boiling with water to a small extent into carbon dioxide and dimethylpyrone. This latter decomposition is more readily effected by boiling the acid with strong hydrochloric acid. If 50 grams are boiled with ordinary fuming hydrochloric acid, the whole is converted into carbon dioxide and a soluble compound of dimethylpyrone with hydrochloric acid. The barium salt of dehydracetic acid,  $(C_8H_9O_3)_2Ba$ , seems to be not a salt of the compound  $C_8H_8O_3$ , but of the true tetracetic acid,  $C_8H_8O_6$ . A very stable copper salt of the formula  $C_{24}H_{25}O_9N_3Cu$  is obtained if dehydracetic acid be added to a solution of copper acetate in a large excess of

ammonia.—The lactone of triacetic acid, by Dr. J. Norman Collie. In a former paper on the constitution of dehydracetic acid (Trans. Chem. Soc., 1890, 189) the author pointed out that if the formula which he proposed for dehydracetic acid was correct, it would be the  $\delta$ -lactone of tetracetic acid. And the following list was given showing the connection between the condensed acids formed from acetic acid:  $CH_3CO.(CH_2CO)_2$ ,  $CH_2COOH$ , tetracetic acid;  $CH_3CO.CH_2CO.CH_2COOH$ , triacetic acid;  $CH_3COCH_2COOH$ , diacetic acid;  $CH_3COOH$ , acetic acid. At that time no acid corresponding to the triacetic acid was known. Since then the author has obtained the lactone of this acid by the action of 90 per cent. sulphuric acid on dehydracetic acid at a temperature of  $130^\circ$ – $135^\circ$ . The properties and reactions of the new compound are described.—The refractive power of certain organic compounds at different temperatures, by Dr. W. H. Perkin, F.R.S. The magnetic relations of substances when examined at temperatures wide apart show that certain variations take place after allowing for change of density. Experiments have been made by the author in reference to the refractive power of liquids under similar circumstances. The results show that the specific refractive power is not constant for all temperatures. By comparing the lines A and F it was found that the dispersion was slightly diminished by rise of temperature. The results were calculated by the formula  $\frac{\mu - 1}{d}$ . When

calculated by Lorentz's formula the numbers gave higher results for high temperatures than for lower ones.—Note on a volatile compound of iron and carbonic oxide, by Ludwig Mond, F.R.S., and Dr. F. Quincke (see NATURE, July 9, p. 234).—The formation of salts, a contribution to the theory of electrolysis and of the nature of chemical change in the case of non-electrolytes, by H. E. Armstrong. The author draws attention to the recent researches of Claisen, W. Wislicenus, and others, which clearly show that ethereal salts form compounds with sodium ethylate, and to the bearing which these results have on the theory of the formation of salts generally. It may be supposed that the acid and the "base" in the first instance combine, and that the salt is formed by subsequent interactions within the molecule. In like manner, acids form dissociable compounds with water, and by the occurrence of change within such systems, under the influence of electromotive force, electrolysis is effected. When the compound is highly unstable, the opportunity for change within its system is slight, the acid is a weak one, and its solution of relatively low conducting power. In the case of non-electrolytes, the occurrence of change may be supposed to occur within complex systems formed by the union of the interacting substances.—Dibenzyl ketone, by Dr. S. Young. The author finds that, in preparing the ketone by heating calcium phenyl acetate in a combustion furnace, only 27 per cent. of the theoretical yield is obtained. However, if the calcium salt be heated by means of the vapour of boiling sulphur, the yield of pure ketone amounts to 76.6 per cent.—The vapour-pressures of dibenzyl ketone, by Dr. S. Young.—The vapour-pressures of mercury, by Dr. S. Young. Two additional observations of the vapour-pressures of mercury at  $183^\circ.75$  and  $236^\circ.9$  have been made, and, from the previous results of Ramsay and Young, the boiling-point and the vapour-pressures of mercury have been recalculated.

June 25.—Extraordinary General Meeting.—At the request of certain Fellows to the President, an extraordinary general meeting was summoned to consider a proposal for amending and altering the by-laws. The proposal was moved by Mr. James Wilson and seconded by Dr. Teed. Mr. Cartrighe moved the following amendment: "That this meeting declines to pledge itself to any amendment or modification of the by-laws which has not been approved and recommended to the Fellows for adoption by the Council." Sir F. A. Abel seconded the amendment. Mr. Cassell, Mr. Lloyd, and Dr. Newton spoke in favour of the original motion. Prof. Tilden, Mr. Warington, Mr. Page, Dr. Odling, and Mr. Friswell spoke in favour of the amendment. The amendment was carried by 137 votes to 47 votes.

##### PARIS.

Academy of Sciences, July 13.—M. Duchartre in the chair.—Calculation of the mean length that a circular tube widened at one end should have in order that a sensibly uniform régime might be established, and on the expenditure of the charge that entails the establishment of this régime, by M. J. Boussinesq.—Contribution to the study of what are called natural prairies, by M.