

While in South Africa Koch has studied horse-sickness, and in a recent report on his work he speaks of "encouraging results which . . . impress me with the conviction that a practical method of protective inoculation against Horse-sickness is within our reach." A serum has been prepared which has slight curative but high protective properties. Unfortunately, the immunity conferred by the serum lasts only for some fifteen days, so that a horse cannot be "salted" by inoculation, and to be safe from an attack the animal must have already had horse-sickness in some form. The "practical method" which Koch proposes consists in producing horse-sickness by an injection of virus, and then arresting its progress by injections of the protective serum before it becomes dangerous. The method has been practised successfully on more than a dozen animals. As the result of his experiments Koch recommends the following treatment:—Seven injections of virus at intervals of twelve days, the doses increasing from 0.01 c.c. to 5 c.c. Four days after each of the first three injections of virus, doses of 100 c.c., 50 c.c., and 50 c.c. of protective serum to be given. The injections of both virus and serum are made subcutaneously in the neck.

#### UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The Frank Smart studentship in botany has been awarded to Mr. A. M. Smith, of Emmanuel College.

Mr. E. R. Burdon, of Sidney Sussex College, has been appointed assistant curator of the botanical museum.

*Science* announces the resignation of Prof. G. Trumbull Ladd as head of the department of mental philosophy and metaphysics of Yale University.

LORD STRATHCONA has given 4000*l.* to the scientific department of the Manitoba University. A block of land sufficient to yield a large annual income is also to be placed at the university's disposal.

THE chair of chemistry in University College, Sheffield, has been accepted by Dr. W. P. Wynne, F.R.S., at present professor of chemistry in the School of Pharmacy of the Pharmaceutical Society of Great Britain.

DR. C. SCHUCHERT, of the U.S. National Museum, has been appointed professor of historical geology in the Sheffield Scientific School of Yale University, and curator of the geological collections in succession to the late Prof. Beecher.

THE "Year-book" for the session 1904–5 of the Armour Institute of Technology, Chicago, a copy of which has reached us, contains full particulars of the course in fire protection engineering instituted last year. The course is arranged to furnish instruction in modern methods of fire prevention and extinction. Since fire insurance interests are closely connected with the work of the course, a portion of the time of senior students is devoted to the study of modern practice of fire underwriting. Prof. Taylor, who is in charge of this department of the institute, has rightly given great prominence in his syllabus to the scientific principles upon which successful work in fire extinction depends.

THE consultative committee to the Board of Education has submitted a number of suggestions to the board for a system of school certificates. The committee is of opinion that, with the object of diminishing the multiplicity of examinations affecting secondary schools, and of providing a test of adequate general education which may be widely accepted, a general system of school certificates is desirable. The committee does not think it is desirable that examinations for such certificates should be conducted by means of papers set for the whole country from a single central organisation. It suggests that such examinations should be controlled by a recognised examining body, which should be either a university or a combination of universities, or an examination board representative of a university or universities, and of the local authorities which are prepared to cooperate with them. It proposes that recognition of these examining bodies should mean recognition by the Board of Education, acting on the advice of the consultative committee. The establishment is

suggested of a central board for England consisting of representatives from the Board of Education and from the different examining bodies, the duty of which should be to coordinate and control the standards of these examinations, to secure the interchangeability of certificates, and to consider and, as far as possible, to adjust the relations of the examining bodies and their spheres of external action. There can be little doubt that some such plan as the consultative committee proposes would enable schoolmasters to utilise in the better education of their boys much of the time now absorbed by the preparation for numerous special examinations.

#### SOCIETIES AND ACADEMIES.

PARIS.

**Academy of Sciences**, July 11.—M. Mascart in the chair.—Thermochemical investigation of the solution and polymerisation of cyanogen: M. Berthelot. Potassium cyanide has considerable thermal effect on a solution of cyanogen whether in water or alcohol.—Note on the heat of transformation of black crystalline sulphide of antimony into the orange coloured precipitate: M. Berthelot.—Condensation of glycol bromoacetate with acetoacetic and acetone dicarboxylic esters: A. Haller and F. March.—Origin in food of the arsenic normally found in man: Armand Gautier and P. Clausmann. Practically all food materials, particularly fish, contain traces of arsenic, the total arsenic received by an average man in a year being 7.66 mg.—The relation between external work and total expenditure of energy in a muscle in dynamic contraction, when the muscle is doing negative work, against the fall of a load, by gradually elongating as the load falls: A. Chauveau. It is concluded that the expenditure of energy is greater in negative work than in fixed contraction, but less than in positive work under the same conditions of load, stimulus, &c., and that in negative work the expenditure of energy increases more rapidly, when the work is increased by increase of load, than by increase of movement.—Note on a new method of observing *n*-rays: R. Blondot.—Analysis of the ashes contained in the urns of Materpa (Thebes, eighteenth dynasty): MM. Loretet and Hugoumenq.—Regulation of watches at sea by wireless telegraphy: J. A. Normand.—The academy appointed MM. Mascart, Troost, Moissan, Guyon, and Lacroix to assist at the inauguration of the Pasteur monument in Paris.—Two problems on isothermal surfaces: L. Ratty.—Explosion waves: E. Jonguet.—Kathode rays and magnetofriction; reply to Villard: H. Pellat.—Note on the refractive indices of solutions: Edmond Van Aubel.—The relation between the pressure of a gas in a vacuous tube and the length of the spark produced: Gaston Séguy. As the pressure decreases in geometric progression the length of the spark increases in arithmetic progression.—The densities of sulphurous anhydride and of oxygen: Adrien Jaquerod and Alexandre Pintza. Morley's method of weighing the gas by the loss in weight of the generating apparatus was used with concordant results in the case of sulphurous anhydride.—The heat of combustion of organic sulphur compounds, and a note on that of compounds containing halogens: P. Lemout. Results of experiments are compared with those obtained by calculation according to the position of the sulphur.—Reactions of the esters of 2:3-butanonic acid. (i) Action of phenyl hydrazine: L. Bouveault and A. Wahl. The phenyl hydrazone obtained in the cold is proved to be that in the 2-position by the formation of the parannitrophenyl hydrazone of methyl phenyl acetopyrazolone previously obtained by Bülow.—Researches in the pyran series: E. Blaize and H. Gautier.—On some phenolic ethers of the pseudo allyl chain R—C(CH<sub>3</sub>)=CH<sub>2</sub>: MM. Behal and Tiffeneau. These bodies are obtained by the magnesium methiodide reaction on the corresponding esters, using one or two molecules in excess of the magnesium methiodide, and are intermediate between the corresponding allyl and isallyl compounds in boiling point, density, and refractive index.—Action of traces of some salts, and of caustic alkalis on diphenyl carbonic ester: R. Fosse.—Mechanism of the action of the cytoplasm in seeds during germination, and the synthetic realisation of this mechanism *in vitro*: Maurice Nicloux. The development of acid in oily seeds, when