

exile, and consequent lack of stimulus, is almost inevitable. Important as are our publications, it is even more through our monthly meetings and the promotion of personal intercourse that the society can help in its primary duty of the advancement of natural knowledge in South Africa.

#### UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

THE discussions at a conference of teachers in rural schools, held in London on December 28, 1910, under the auspices of the National Union of Teachers, showed that teachers are recognising more fully the desirability of making the education in elementary schools in country districts so far as possible of a practical kind, which will train the children for agricultural and other country avocations in later life. A resolution was adopted unanimously urging that, wherever possible, some teaching in handicraft and housecraft should be given to children in rural schools, and that, where necessary and practicable, centres for instruction in these subjects should be formed. It was suggested during the discussion that central school farms might be established, where practical work on the land could be carried on by boys drafted from neighbouring schools. It was recognised, also, that actual work in a garden abounds in opportunities for the best lessons in observation, attention to detail, never putting off until to-morrow what ought to be done to-day, as well as the cultivation of the virtues more commonly associated with the moral instruction lesson. Another resolution, unanimously carried, deplored the continuance of the partial exemption system, and declared that the time has arrived when no child shall be either partially or totally exempt from attendance at school before fourteen years of age. A discussion on continuation schools in rural districts revealed some diversity of opinion, but the meeting eventually decided that, having regard to the impossibility of satisfactorily organising and coordinating continuation work in rural districts, where children are at present allowed to secure partial exemption from school attendance at the early age of eleven or twelve for the purpose of employment, no exemption, either partial or whole-time, from day-school attendance should be granted until the age of fourteen years is attained, all wage-earning child labour out of school hours under the age of fourteen should be forbidden by law, and these conditions having been secured, a system of compulsory attendance at continuation schools or other suitable educational institutions from the age of fourteen to eighteen, accompanied by provisions which should safeguard young people against undue physical or mental overstrain, should be an integral part of a national system of education.

#### SOCIETIES AND ACADEMIES.

##### DUBLIN.

Royal Dublin Society, December 20, 1910.—Mr. R. Lloyd Praeger in the chair.—Dr. J. H. Pollok: The vacuum-tube spectra of the vapours of some metals and metallic chlorides (part i.). By the use of a new form of vacuum tube, made entirely of quartz, which the author has recently devised, he can readily obtain photographs of the whole of the vacuum-tube spectra of the vapours of metals and metallic chlorides. In the present paper the author gives a description of the quartz vacuum tube and photographs of the spectra of the vapours of mercury, zinc, cadmium, arsenic, and antimony, together with photographs of the spectra of their chlorides, under varying conditions. The vapours of the metals and their compounds, so far examined, show substantially the same line spectrum in the vacuum tube that they do when metallic electrodes are sparked in air. When a condenser is introduced in the circuit, the metal and its compound show precisely the same change of spectrum, which would seem to indicate that the changes take place in the vibrating atom. If a large amount of vapour of the chloride is present without a condenser, bands are seen in addition to the line spectrum of the metal, and these appear to be due to the particular compound present, and must therefore be connected with the vibrations of the molecule.

—Dr. G. H. Pethybridge: Considerations and experiments on the infection of potato plants with the blight-fungus (*Phytophthora infestans*) by means of mycelium derived direct from the planted tubers. The theory recently advocated by Massee, that the potato crop becomes attacked with the "blight," not by means of the "spores" of *P. infestans*, but by means of the mycelium of this fungus, which, after lying dormant for a long period, passes from the planted tubers into the nearly full-grown stalks, is criticised, and it is pointed out how difficult it is to reconcile this mode of infection with the well-known facts of the disease. It is shown that, owing to the absence of controls, the experimental evidence on which the theory is based is quite worthless. A repetition of the experiments, carried out by the author with the necessary controls, gave results exactly the opposite to those on which the theory is based.—Rev. H. C. Browne: Some suggested improvement in epicyclic variable gears. The improvement applies specially to the modern bicycle, and consists in effecting the complete separation of the epicyclic train from all the moving parts on the middle speed, so that the friction is reduced to the same amount as if the machine were a single-gear machine, i.e. so that there is no movement except that of the ball races at each end of the axle. The high and low speeds are also improved by getting rid of all friction due to over-running pawls or the unnecessary rubbing of parts. The middle speed is produced directly by the engagement of the driving member with the hub, the epicyclic train being completely detached and in no contact with any of the moving parts. The linking up of the gear train with the drive for the high and low speeds is effected in a simple manner by the use of spring trigger pawls. Some care has been given to the construction of the epicyclic train so that it may be a proper mechanical unit in itself instead of being a somewhat loose assemblage of wheels. With this object, the wheels of the train are provided with friction discs reaching to the pitch lines, and the friction between the elements of the train is thereby reduced to rolling friction.

##### PARIS.

Academy of Sciences, December 27, 1910.—M. Émile Picard in the chair.—A. Gaillot: The analytical theory and tables of motion of Jupiter, by Le Verrier. Additions and rectifications. These tables represent with sufficient exactitude the observations made between 1750 and 1869. From 1870, the comparison of the observed and calculated positions shows increasing discrepancies. The tables for Jupiter have now been recalculated, and the results compared with observations for the period 1750 to 1906-7.—Paul Sabatier: A method for causing two substances to react in the electric arc. The method described by M. Salmon in a recent note (December 5) was anticipated by the author in 1899.—W. Kilian and M. Gignoux: An attempt to coordinate the levels of the pebble beds and terraces of the Bas-Dauphiné.—The perpetual secretary announced the death of Armand Sabatier, correspondent for the section of anatomy and zoology.—J. Guillaume: Observations of the sun made at the Observatory of Lyons during the third quarter of 1910. Observations were possible on sixty-four days during the quarter. Three tables of the results are given, showing number of spots, their distribution in latitude, and the distribution of the faculæ in latitude.—Maurice Servant: The transformations of surfaces applicable to surfaces of the second degree.—T. Lalesco: Left-handed symmetrical nuclei.—G. Kowalewski: The formulæ of Frenet in functional space.—L. Zoretti: The equations of motion of a viscous fluid.—G. de Proszynski: The application of the gyroscope and of compressed air to taking cinematographic views. The gyroscope is driven by compressed air, and is attached to the camera in such a manner as to suppress or deaden small vibrations.—Jean Becquerel: The positive magneto-optic effect presented by the phosphorescence bands of rubies and emeralds, and the relations between emission and absorption in a magnetic field.—J. Thovert: Photometry and the utilisation of coloured sources of light. A description of a new empirical spectrophotometric method.—Daniel Berthelot and Henry Gaudechon: The principal types of photolysis of organic compounds by the ultra-violet rays. The photolysis of