

places adopted by the council of the Royal Geographical Society, the Foreign and Colonial Office, the Admiralty, and the War Office be used."

"That an organised scheme for the future of the Australian aborigines be formulated and submitted for the consideration of the Federal and State Governments, and that the following be a committee to collect evidence, draw up and submit a proposed scheme to aid these authorities in the event of their consenting to take up the question, and that such scheme receive the support of the association:—Prof. J. Wilson, Dr. Norris, Prof. Baldwin Spencer, Prof. Stirling (Adelaide), Mr. Gillen, Rev. Dr. G. Brown, Archdeacon Lefroy, Dr. Cleland, with power to add to their number."

**Anthropometric Tests.**—“(1) This section recommends that all anthropometric measurements under the control of the Australasian Governments be based on the schedule of the British Anthropometric Committee. (2) That the advantage of utilising for this purpose the existing machinery for medical inspection of school children in the various States, and of the compulsory cadet service of the Commonwealth, be urged on the authorities concerned. (3) That a committee, consisting of Profs. Masson, Lyle, and Osborne, Drs. Norris and Harvey Sutton, Mr. Tate, Colonel Watson, and the Public Works Architect, be appointed to investigate the subject of ventilation in buildings, and that the committee be asked to present a report to the next meeting (Melbourne).”

**General Recommendation.**—“That the president of the association be requested to communicate with the Prime Minister of the Dominion of New Zealand, and place before him the desirability of proceeding with the work of describing and publishing the results of the examination of the collection of fossils made by the officers of the Geological Survey of New Zealand, and deposited in the Dominion Museum, Wellington.”

“That it is important in the interests of higher education that additional university teaching should be provided in the department of philosophy, more especially in the subjects of sociology and experimental psychology.”

“That a time limit be set for authors of papers read before the association, which shall not be exceeded except by special arrangement made beforehand with the sectional committee.”

“That a general discussion on ‘The Eucalypts and their Products’ be brought forward at the Melbourne meeting.”

**Geophysical Observatory at Barren Jack.**—The sum of 50*l.* was voted to assist in defraying the expense of establishing a geophysical observatory near Barren Jack reservoir, for the purpose of attempting to measure the amount of earth tilt under load.

**Survey Work around New Zealand.**—“That, in the opinion of the Australasian Association, the investigation of the continental shelf around New Zealand and the islands of the south of New Zealand is a work of pressing necessity, both for scientific and for economic reasons; and the association, while recognising the value of the work already done in this direction, would urge upon the New Zealand Government the desirability of taking advantage of the facilities offered by the stay of the Antarctic exploring ship, *Terra Nova*, in New Zealand to complete the survey of the surrounding seas by soundings and dredgings as far as possible.”

**Protection of Forests.**—“That, in view of the vital importance of the conservation of water in Australia by the protection of forests and timber around the sources of its rivers and streams, and which was to have been considered at the present congress, but was deferred until the next meeting in Melbourne, by resolution carried last Monday, it is advisable that a special committee be now appointed to deal with the question in the meantime, and also bring it to the notice of the several Governments of the Commonwealth, in order to prepare the way for a more successful result when dealing with the matter at the Melbourne meeting.”

**Geological Committees.**—(1) A committee to inquire into the question of the classification of the Perno-Carboniferous of Australia, with a view to the revision of the nomenclature. (2) A committee for recording structural features in Australia. (3) A committee to investigate and report on the glacial phenomena in Australasia. (4) A

committee to investigate questions of quaternary climate in Australasia. (5) A committee for the investigation of the alkaline rocks of Australasia.

**Tidal Survey.**—“The Australasian Association for the Advancement of Science at its Sydney meeting in 1911 views with satisfaction the successful establishment by the New Zealand Government of the Tidal Survey, and trusts that at many of the outlying islands automatic tide gauges may be established, and the results systematically analysed. It directs that a copy of this resolution be forwarded to the Prime Minister of New Zealand.”

**Scientific Literature.**—“That a committee be appointed to consider the steps which should be taken with a view to the compilation of a list, as complete as possible, of the scientific serial periodical literature, both in public and private possession in each of the principal centres of Australia.”

The council passed the following resolutions with regard to Antarctic exploration:—“This committee recommends that the sum of 1000*l.* be paid from the funds of the association towards the expenses of the proposed Antarctic expedition, on the following conditions:—

“(1) That the expedition be under the supreme command of Dr. Mawson, free from control by any authority outside Australia.”

“(2) That the details of the scientific work and the appointment of the members of the expedition be placed in the hands of a special committee of the association, such committee to have full power, subject to the approval of the leader of the expedition. But this condition shall be open to modification after consultation with the Commonwealth Government.

“(3) That Sir E. Shackleton's full consent to the first condition be first obtained.

“(4) That the sum subscribed be spent upon instruments, which shall become the property of the association on the conclusion of the expedition.”

The Governor, Lord Chelmsford, gave a garden-party at Government House, Rose Bay. The association received similar hospitality from Miss Macdonald, principal of the Women's College.

The president of St. Ignatius College, Riverview, invited the members of Sections A and C to visit the college to inspect the fine seismological observatory installed at the college. Other invitations were received from various engineering departments of the State. Dr. Harvey Sutton, of Melbourne, gave a demonstration showing how to make and to throw boomerangs.

Prof. T. W. Edgeworth David was unanimously elected president for the next meeting of the association, which will be held in Melbourne in 1913.

## UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

THE thirty-eighth annual dinner of the old students of the Royal School of Mines will be held on Thursday, May 4, at the Café Monico, Piccadilly Circus, W. The chair will be taken by Sir Thomas H. Holland, K.C.S.I., F.R.S. Tickets may be obtained from the hon. secretary, Mr. Arthur C. Claudet, 6 and 7 Coleman Street, London, E.C.

ON Tuesday, April 25, at 10 a.m., Mr. Clifford Dobell will commence a series of twenty lectures on the structure and life-history of the Protista (Protozoa and Protophyta) in the zoological department of the Imperial College of Science. The lectures will be given on Tuesdays and Thursdays at 10 a.m., and will be followed by practical work on Wednesdays, April 26, at 5 p.m. Prof. E. W. MacBride, F.R.S., will begin a course of sixteen lectures on “Experimental Embryology.” These lectures will be given on Wednesdays and Fridays at 5 p.m., in the zoological department of the Imperial College. Practical work in connection with the lectures will be given twice a week, at times to be arranged. Both Prof. MacBride's and Mr. Dobell's lectures are free to the public.

IN *The School Review* for April a report appears of a lecture by the superintendent of schools at Munich, Dr.

Kerschensteiner, in which he describes the compulsory continuation schools of that city, where more than 90 per cent. of the children between the ages of six and eighteen are in attendance at one class or other of public school, and where the pupils in the compulsory continuation schools average 330 hours per annum of attendance. These schools are of two kinds, a highly organised kind for youths between the ages of fourteen and eighteen during their apprenticeship, at which they receive instruction in specific relation to their trades, and a continuation school for girls, at which three years' attendance is compulsory subsequent to the close of the primary-school career at the age of thirteen. The boys' schools cater specifically for every trade in which there are twenty-five apprentices, and there are fifty-two special trade schools as well as twelve general schools. The girls' course of instruction, at present, deals almost exclusively with domestic matters, but attention will be devoted to industrial affairs as the scheme is thoroughly developed. "The only path to real State-community," remarks Dr. Kerschensteiner, "is to accustom the children from their earliest years to do their work, not only for their own personal advantage, but also for the advantage of their youthful companions. Only thus can we hope to develop the two great fundamental virtues of devotion to aims outside ourselves and of consideration for the interests of others. And only thus will it in all probability be possible to preserve our great modern constitutional States from the dangers which threaten them through their own industrial, economic, social, and political development."

At the afternoon sessions of the forthcoming Imperial Education Conference, which will be held on April 25-28 inclusive, the following papers will be read and followed by discussion:—Tuesday, April 25: Mr. H. J. Mackinder, M.P., the teaching of geography from an imperial point of view, and the use which could and should be made of visual instruction; Prof. H. E. Egerton, some aspects of the teaching of imperial history. Wednesday, April 26: Mr. Marshall Jackman, experimental work in the teaching of arithmetic in elementary schools; Mr. J. G. Legge, practical education in elementary schools; Mr. J. Strong, secondary education in Scotland. Thursday, April 27: Dr. J. A. Ewing, C.B., F.R.S., engineering education; Mr. J. H. Reynolds, higher technical instruction. Friday, April 28: Mr. R. Blair, trade schools; Mr. Graham Balfour, continuation schools. These sessions will be held at the Foreign Office, and persons who have special knowledge of, or interest in, the various subjects which are to be dealt with at each particular session have been invited, but in view of the small space available the number of invitations has had to be strictly limited.

THE London County Council has recently decided to make a maintenance grant of 8000*l.* to the Imperial College of Science and Technology, South Kensington, S.W. In return for this grant it secures the privilege of nominating twenty-five students for one year's free instruction at the Imperial College. These places are to be filled as from October, 1911. The instruction will be of an advanced nature, and therefore only advanced students who are qualified to enter on the fourth year of the course should apply. There is no restriction as to income, but intending candidates must be ordinarily resident in the administrative county of London, and must be students at an institution aided, maintained, or approved by the Council, for this purpose, who have attended regularly courses of instruction for at least two sessions. The free studentships do not entitle the holders to any maintenance grants, but cover all ordinary tuition fees. No examination will be adopted for the final selection of the students from the applications received. The free studentships will be awarded on consideration of the past records of the candidates, the recommendations of their teachers, the course of study they intend to follow, and generally upon their fitness for advanced study in science applied to industry. It is quite possible that, in special cases, the free places may be extended to two or more years. Application forms (T. 2/268) can be obtained from the Education Officer, London County Council, Victoria Embankment, London, W.C., and must be returned not later than Saturday, May 27, 1911.

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THE summer field session for 1911 of the School of American Archæology, of the Archæological Institute of America, will be held at El Rito de los Frijoles, near Santa Fé, New Mexico. Facilities will be given students to observe or to participate in the excavations, begun in 1908, and now in progress at Tyuonyi, near by talus pueblos and cliff-dwellings. Excursions will be made to facilitate a study of botanical and other environmental conditions of the tribes dwelling in the vicinity. During August, lectures will be given on the distribution and culture of the tribes in the south-western section of the United States; on the evolution of design as shown in ancient Pueblo art; on the native languages, and methods of recording them. A course will be given by Dr. Lewis B. Paton, formerly director of the American School in Jerusalem of the Archæological Institute of America, on "The Ancient Semites," to afford an opportunity of a comparative study of cultures developed in semi-arid regions in the eastern and in the western continents. The object of the annual summer field session of the School of American Archæology is to bring together persons interested in the study of anthropology, for investigation and discussion, and to give students the opportunity for field work needed, to supplement university instruction. At the close of the session opportunity will be given to visit the pueblos of Taos and Acoma, and the Government excavations among the cliff-dwellings in the Mesa Verde National Park, Colorado. Details of the summer session may be obtained from the Director of the School of American Archæology, Santa Fé, New Mexico.

THE council of the Teachers' Guild has addressed a letter to the Board of Education on the subject of co-operation between labour exchanges and local education authorities, approving the principle of such cooperation, provided that the employment of juveniles be primarily considered from the point of view of their educational interests and permanent careers. The guild recommends that the subcommittees to be appointed for this work should include county councillors, H.M. inspector and council inspectors, directors of technical and continuation classes, representative employers and workmen, and representatives of the head teachers, of the school managers, and of the care committees (where they exist). The central offices for this work should be located within, and form part of, the offices of the local education authority, and from age fourteen to seventeen the "juveniles" should be, to some extent, under the supervision of the education officers of the county authority. The letter points out the important results which may flow from the adoption by local authorities of the powers offered to them by the Education (Choice of Employment) Act, 1910. We quote the following passages, which summarise views frequently expressed in NATURE:—"In the past the lack of adequate linkage between the work of the ordinary schools and that of technical classes has been felt to be a most serious hindrance to technical education. The removal of this hindrance is desirable, but of greater future importance is the opportunity for systematic schemes for the continued education of boys and girls *directly after they have left school*. . . . The experience of teachers, and of those engaged in research into mental development, points to the enormous importance of the period between fourteen and seventeen years. . . . The work of ordinary elementary and secondary schools should be in closer touch with everyday life. . . . Some of the work of continued education should be done in day schools. The cooperation of employers is essential."

FORTY-ONE annual conferences of the National Union of Teachers have been presided over by men whose addresses have received and deserved considerable public attention. This year, for the first time, a woman took the presidential chair, and special interest therefore attaches to her speech. We recognise in Miss Cleghorn's address a womanly regard and sympathy for the children, which in no wise detracts from the breadth of view evinced by her chairmanly utterance. Dealing first with the infants' departments, she deprecated the exclusion of young children under five when home conditions do not permit adequate maternal care and training. Again, it is a disastrous policy to promote children to the older depart-

ments before they are fit, as is frequently done for the sake of higher grants. For the lower standards in the boys' and girls' departments she claimed more freedom, more activity, a better bridge from the infants' school. She asked that in the ordinary schools there should be a later leaving age, a more suitable curriculum, smaller classes, better attendance. All education up to twelve should be primary in name and practice. The transition to secondary schools should be easy for all scholars about the age of twelve years, and secondary schools of varying types should provide the coping-stone of primary education. Miss Cleghorn pleaded for the abolition of half-time, for a more vocational bias in the work of the present secondary schools, and for the extension to England of the powers already granted to Scotland of enforcing attendance at continuation schools until the age of seventeen years.

AMONG other matters of wide interest which were brought before the National Union of Teachers at the Aberystwyth conference we note especially the careful statement of the difficulties attending ameliorative medical work, contributed by Dr. Lewis Williams, the Bradford medical superintendent. At the Bradford school clinic 6446 cases were dealt with during last year, of which 3520 have actually received treatment, and of these 3000 have been cured of disease, had vision corrected, or teeth attended to. It is impossible to read this paper without arriving at the conclusion that the school clinic is a valuable—even a necessary—institution, and that the case for the extension of school clinics has an appalling strength. In view of recent controversies, it was inevitable that keen interest should be shown in the subject of a paper by Mr. T. P. Sykes, "Function and Position of H.M. Inspectors of Schools in the Elementary-school System," read at the same conference. The paper was evidently written before the recent Parliamentary discussion, and its main purpose was to put forward a view of the duties of the inspectorate which is very different from the one which appears to prevail. Mr. Sykes would wish inspectors to devote their energies to securing proper conditions of work, involving adequate expenditure and administration. They should see that the Medical Inspection and the Child Feeding Acts are properly carried out, that schools are not overcrowded, that there are proper staffs of certified teachers, that salaries are such as to secure efficiency. As a professional teacher, Mr. Sykes protested against the present system of interference by inspectors with methods of teaching, and he gave instances of its deleterious effect. Mr. Sykes did not, however, suggest any method of testing the efficiency of the work.

## SOCIETIES AND ACADEMIES.

LONDON.

**Geological Society**, April 5.—Dr. C. W. Andrews, F.R.S., vice-president, in the chair.—E. S. **Cobbold**: Trilobites from the Paradoxides beds of Comley (Shropshire), with notes on some of the associated brachiopoda by Dr. C. A. Matley. The author describes and illustrates the type-specimens of *Paradoxides groomii*, Lapworth, 1891, and the associated trilobites from the basement beds of the Middle Cambrian of Comley Quarry. Among the latter there are two or three other species of Paradoxides, represented by fragments insufficient for specific determination; also a species of *Dorypyge*, allied to *D. oriens*, Grönwall, and one of *Conocoryphe* allied to *C. emarginata*, Linnarsson. He also describes some of the trilobites from a higher horizon containing *Paradoxides davidis*, Salter, and *P. rugulosus*, Corda; and notes on the brachiopoda from this horizon are contributed by Dr. Matley. A complete list of the trilobites hitherto identified from the local Cambrian deposits is given.—Dr. D. **Woolacott**: The stratigraphy and tectonics of the Permian of Durham (northern area). The Permian strata of Durham and Northumberland lie unconformably on a basin of the Coal Measures; they may be divided into:—(4) upper red beds with salt and thin fossiliferous Magnesian Limestones

(only exposed in the south of Durham), 300 feet; (3) the Magnesian Limestone; (2) the Marl Slate, 3 feet; (1) the Yellow Sands, from 0 to 150 feet. These beds, which vary much in thickness, lie in North Durham in the general form of a syncline beneath Sunderland. The unfossiliferous Yellow Sands are probably a deltaic formation reassorted by wind, the other beds being the result of deposition in an inland sea undergoing desiccation. The magnesium carbonate existed in the waters of the sea, and was either deposited along with the calcium carbonate or introduced by seepage when the beds were being laid down. Great changes in the amount and distribution of these carbonates have, however, taken place since deposition. The percentage of calcium carbonate is sometimes more than 99, while that of magnesium carbonate is occasionally as much as 50. The fauna of the Magnesian Limestone is very restricted (about 140 species) and most peculiarly distributed. The marked palæontological features are the profusion of individuals in the Middle Fossiliferous Limestone (which appears to have formed a shell-bank in the Middle Magnesian-Limestone sea), and their sudden disappearance in the Upper Limestone. No corals, echinoderms, polychaeta, brachiopods, or cephalopods have ever been found above the top of the Middle Fossiliferous division, only a few fishes, gastropods, lamellibranchs, entomostraca, and foraminifera occurring in the Upper beds. The Lower and Middle Fossiliferous Limestones are marked by the presence of *Productus horridus*, Sow. Fish-remains occur at two horizons, namely, the Marl Slate and the Flexible Limestone, and the beds above these deposits. The Brecciated beds, which occur at various horizons, chiefly, however, in the two Middle divisions, constitute the most marked tectonic feature of the Magnesian Limestone of the area. They have been produced by thrusting, which brought about a decrease in the lateral extension of the Permian. Associated with the breccias are other proofs of thrusting:—(1) thrust or shear-planes; (2) disturbed and displaced masses of Lower Limestone; (3) intruded breccias; (4) slickensided and grooved, horizontal and vertical surfaces; (5) cleavage; (6) folding, both on a local and on a general scale; (7) buckling, thickening, and squeezing-out of beds; (8) phacoidal and other structures; and (9) fissuring.

DUBLIN.

**Royal Dublin Society**, March 28.—Mr. R. Lloyd Praeger in the chair.—Prof. T. **Johnson**: (1) *Archaeopteris simplex*, sp. nov.; (2) Is *Archaeopteris*, Dawson, a pteridosperm? The author gave an account of his examination of specimens of *Archaeopteris*, Daws., in the botanical division of the National Museum, and in the Royal College of Science, Dublin. He recorded in the first part of his paper the occurrence in the south of Ireland, in the Upper Devonian beds, of *A. hibernica*, var. *minor*, Crépin, *A. roemeriana*, Göpp., and *A. Tchernaki*, Stur, in a fertile state. In the second part of the paper certain features in the structure of *A. hibernica*, Forbes, sp., are described. The more interesting features are the presence of fertile adaxial and sterile abaxial lobes in the fertile pinnule or *sporophyllule*, the vascularity of the stalk of the sporangium, and the transverse septation of the latter. The paper concludes with a discussion of the relationship of *Archaeopteris* to the Ophioglossaceæ, the Sphenophyllaceæ, and the Pteridospermeæ.—Dr. J. H. **Pollok**: The vacuum-tube spectra of the vapours of some metals and metallic chlorides. The author showed reproductions of the spectra of the metals or chlorides of thallium, lead, copper, bismuth, iron, aluminium, chromium, manganese, nickel, cobalt, barium, strontium, calcium, magnesium, potassium, sodium, and lithium taken by means of his new quartz vacuum tube. As observed in the spectra referred to in part i. of this paper, there is invariably a marked difference between the spectra taken without a condenser and with a condenser in the secondary circuit. In the former case bands show a greater tendency to develop, in the latter there are invariably many more lines, but some become weaker. The new lines, and lines that become stronger, are very generally those showing the discontinuous lines when metallic electrodes are sparked in air, and a spherical condenser is used in photographing.