

allies) with stamens of the outer whorl. Abortion is very frequent, and in certain species (*amphibium*) this whorl has completely disappeared.

Miss Lily Huie contributed some observations on the changes in the tentacle of *Drosera rotundifolia*, produced by feeding with egg albumen.

In unfed leaves fixed in watery picro-corrosive (sp. gr. 1.020) and stained with Eosin-Toluidin blue, the apical and lateral glands of the first or outer layer, and also all the cells of the second or middle layer, show a deep-blue cytoplasm, with nuclei possessing little chromatin proper, but large nucleoli and a granular nucleoplasm. Within one minute after feeding the blue cytoplasm becomes purple; after one hour it is greatly vacuolated and reddish purple; after twenty-four hours the blue material has disappeared, and only a few strands of a pink cytoplasm are to be seen. The nucleus after feeding loses the granular cytoplasm, the nuclear chromatin segments enlarge enormously, reminding one of the early stages of mitosis. The nucleolus has lost its red chromatin, and is not easy to see.

Recuperation of the cytoplasm is the result of nuclear activity, for the chromosomes enlarge during the period preceding the appearance of the granular nucleoplasm, which latter in every respect resembles the granular deposit of cytoplasm in immediate contact with the outer surface of the nuclear membrane.

Dr. Morris, C.M.G., contributed a note on the singular effect produced in certain animals in the West Indies, by feeding on the young shoots, leaves, pods, and seeds of the wild tamarind or Jumbai plant (*Leucena glauca*, Benth.). The wild tamarind of Jamaica, and the Jumbai or Jumbie of the Bahamas, is commonly found along roadsides and in waste places in tropical America. It presents the appearance of a weedy-looking *Acacia*, and belongs to the tribe *Eumimosæ* of the N.O. *Leguminosæ*. It occurs in the West Indies, Bahamas, Demerara, Brazil, Peru, gardens of South Europe and North Africa; widely found in tropical Africa, East Indies, Ceylon, Mauritius, Java and China.

The author described the plant as being distinctly encouraged in the Bahamas as a fodder plant. The people were fully aware of the singular effect it produced on horses, and added that it also affected mules and donkeys. Its effect on pigs was still more marked. These animals assumed a completely naked condition, and appeared without a single hair on their body. Horses badly affected by Jumbai were occasionally seen in the streets of Nassau, where they were known as "cigar-tails." Such depilated animals, although apparently healthy, were considerably depreciated in value. They were said to recover when fed exclusively on corn and grass. The effects of the Jumbai on horses, mules, donkeys, and pigs were regarded as accidental—due to neglect or ignorance. The seeds probably contain the deleterious principle in a greater degree than any other part of the plant. The active principle in *Leucena glauca* has not yet been investigated. There is abundant material at hand for this purpose in almost every part of the world. It is probable that the active principle may consist of a volatile alkaloid somewhat similar to that found in *Lathyrus sativus*.

In *Leucena glauca* we possess a plant with singular properties. It is a vegetable depilatory of a very decided character. No other plant appears to produce exactly identical results.

Mr. Scott Elliot read a paper on the influence of habitat upon plant-habit. The author gave the results of an attempt to tabulate and compare the habits and habitats of the *Ranunculaceæ*, *Papaveraceæ*, &c., in the Kew and British Museum herbaria. The tables exhibited illustrated the dependence of habit upon habitat in 230 plants. In conclusion the author anticipated the objections of those who hold the original hypothesis of Prof. Weismann (that acquired characters can by no means be inherited), by pointing to the most recent publication of this writer, wherein use inheritance of a kind is admitted.

Dr. Wilson exhibited a series of excellent photographic lantern slides illustrating his numerous experiments on hybridisation in Passion flowers and Albucas. The first paper, on a new hybrid Passion flower, dealt with a cross between *Passiflora Buonaparteæ* and *P. Cvrulea*, the latter being the pollen-parent. The former has a quadrangular winged stem, and the leaves are elliptical in outline; the latter has a cylindrical stem, and the leaves five-lobed. The stem of the hybrid exhibits many intermediate characters, and the leaves are three-lobed. The presence of a group of glands terminating the coronal filaments was shown on the screen. The glands are present in the seed-

parent, but not in the pollen parent, and in the hybrid they appear in reduced number.

In a further communication, dealing with observations on hybrid Albucas, Dr. Wilson exhibited a large series of illustrations from nature, showing the effects of hybridisation on the bulbs and flowers of these plants. He described a new species, named by him *A. prolifera*. This species is characterised by producing remarkable lateral outgrowths which carry young bulbs, while it also bears numerous obscurely-stalked basal bulbils.

Mr. Gwynne-Vaughan gave an account of his investigations on the arrangement of the vascular bundles in certain *Nymphaeaceæ*.

Mr. Keeble described certain observations on the *Loranthaceæ* of Ceylon, relating to the emergences on the embryo of *Loranthus neelgherensis*, and to the mode of penetration into the host.

Fossil Plants.

Dr. D. H. Scott, F.R.S., gave an account of some researches on certain Carboniferous fossils referred to *Lepidostrobus*.

Mr. A. C. Seward contributed notes on a large specimen of *Lyginodendron*, based on the examination of specimens in the British Museum. He proposed to designate the species *L. robustum*.

Mr. Seward also gave an account of a new cycad from the Isle of Portland.

Dr. Woodward lately obtained an exceedingly fine specimen of a cypripedian stem from the Purbeck beds of Portland, which is now in the fossil plant gallery of the British Museum. The stem, which is probably the largest known, has a height of 1 m. 18.5 cm., and measures 1 m. 7 cm. in girth at the broadest part. A striking feature of the specimen is the conical apical bud enclosed by tapered bud scales, bearing numerous ramal outgrowths on the exposed surface.

REPORT ON TECHNOLOGICAL EXAMINATIONS.

THE Report, just issued, on the work of the Examinations Department of the City and Guilds of London Institute, is a noteworthy document. The functions of this department of the Institute extend beyond those of an ordinary Examining Body. Its efforts have been directed for many years towards encouraging, in different ways, sound technical instruction; and the aim of the Committee has been rather to secure for artisan students systematic teaching, than to increase the number of candidates for examination. Unfortunately, such students are often quite unprepared to receive technical instruction.

Several of the Examiners refer to the defects of the earlier education of the students, and some surprise is expressed that the candidates spell so badly and experience such difficulty in expressing what they know in words. The Examiners in plumbers' work complain that very few of the candidates knew how to work out a simple geometrical problem, and that in those elementary principles of science which underlie plumbers' work, a very small proportion of the candidates appear to have received any adequate instruction. Among engineering apprentices, a large number of candidates appear to have attended science classes; but in the subjects of weaving and spinning, and in most other subjects, the number is very small. The Committee of the Institute have consequently come to the conclusion that the principles of science should be presented to the artisan student in a form bearing more directly upon the trade in which he is engaged, than is possible when the elements of any one branch of science are taught to a large class of students occupied in different pursuits. They have accordingly added to their programme a course of instruction to be taken before certain technical subjects. This difficulty as to inadequate preliminary knowledge is met with all over the country, and is a constant cause of failure in many branches of the work of Technical Education Committees.

Another difficulty widely experienced is to find competent teachers for trade classes. This arises from the combination of qualifications required in such teachers. It is desirable that they should spend sufficient time at their trade to have become skilful workmen; they must have some knowledge of scientific method, besides having received a fairly good general education. The Committee think that facilities in the way of scholarships should be offered by County Councils to intelligent workmen, to

enable them to spend two years at a Central Technical School, in order to acquire the necessary knowledge of scientific principles and some acquaintance with methods of instruction. Whether the "intelligent workman" would afterwards be content to pass his days in the workshop, and his evenings in the class-room, is another story. But however this may be, the intentions of the Committee are good, and we should be sorry to say anything which would tend to depreciate the admirable efforts they are making to improve the condition of technical education in this country. Mr. G. Matthey, the Chairman of the Committee, and Sir Philip Magnus, the Superintendent of the examinations, deserve the thanks of every one interested in the development of our industries for their organisation of knowledge which lies at the root of such developments.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—Dr. Glaisher, F.R.S., has been appointed Chairman of the Examiners for the Mathematical Tripos, Part II. of 1897. Mr. J. G. Leatham, fourth wrangler 1894 and Isaac Newton Student in Astronomy, has been elected to a fellowship at St. John's College; and Mr. W. E. Philip, third wrangler in the same year, to a fellowship at Clare College. Mr. W. E. Johnson, of King's College, has been appointed to the University Lectureship in Psychology, vacated by Mr. G. F. Stout, editor of *Mind*.

A COMMITTEE has been appointed to consider the mode in which the grants in aid to science and art schools are distributed, and to report if it is desirable to make any alteration therein. The members consist of the Vice-President of the Committee of Council on Education (Chairman); Mrs. Sidgwick, Sir John F. D. Donnelly, K.C.B., Secretary of the Science and Art Department; Sir H. Roscoe, F.R.S., Mr. G. L. Ryder, H.M. Treasury; Prof. R. C. Jebb, M.P., Mr. W. Armstrong, Director of the National Gallery, Dublin; Captain W. de W. Abney, C.B., F.R.S., Science and Art Department (Secretary).

It is announced in *Science* that the Chicago Institute of Education has appointed a committee of sixty to develop some feasible plan for carrying on systematic outdoor, or field work, in connection with nature study. The committee held its first meeting on September 19, and a permanent organisation was effected by the election of Mr. Wilbur S. Jackman as President, and Mrs. M. L. T. Baker as Secretary, and the appointment of a number of sub-committees. One of the first works of the committee will be the preparation of maps of the environs of Chicago, which will assist the pupils and teachers of the public schools in a systematic study of the country lying within a convenient radius of the city.

THE sum of £25,000 has now been subscribed for an engineering laboratory at Glasgow University (says *Engineering*), and the same tact and energy which have been displayed in finding the money, will result in an early realisation of the aim of the promoters. The sum of £12,500 was voted out of the Bellahouston Trust Estate, and the remainder has been readily subscribed by engineers and others in the district. Meanwhile a temporary laboratory is to be equipped, two large rooms having been set apart in the main building. This, however, will not even delay the arrangements for the new laboratory. A gas engine of ten horse-power is being presented to the University by the Committee of the Murdock Memorial Fund, and this will commemorate the association of the founder of gas-lighting with James Watt. The testing plant will include a ten-ton machine, with tension, compression, shearing, and bending tackle and an autographic stress-strain recorder, while a melting furnace will be constructed for making alloys.

ABUNDANT evidence of the continued increase in the number of well equipped and properly staffed technical schools throughout the country is afforded by the current number of the *Record of Technical and Secondary Education*, which is published quarterly under the auspices of the National Association for the Promotion of Technical and Secondary Education. A detailed review of the work accomplished in thirteen county boroughs is given; and selected as these are from all parts of the country, they afford an excellent means of judging of the general advance which has taken place since the passing of the Technical Instruction Act of 1890. The photographs of the various

departments of the Battersea Polytechnic, and the Victoria Institute, Worcester, show that the plan upon which these new places of instruction are furnished leaves very little to be desired. The editorial notes, with which the publication opens, emphasise the occurrences of special educational interest during the preceding three months, and, together with the article on intermediate education in Wales, they show that the Association has reason to be satisfied with the results of its efforts to improve the knowledge of the workers of this country. Reference is made in the *Record* to the Return recently presented to Parliament, showing that the total income of evening continuation schools in this country amounts to £189,130 3s. 1d., made up as follows:—Grants by the Education Department, £81,362 3s. 4d.; grants by the Science and Art Department, £1410 12s. 11d.; grants by County Councils, £16,440 11s. 2d.; School Board rates, £58,516 12s.; voluntary contributions, £7432 7s. 8d.; school fees and books, £22,303; endowment, £515 18s.; other sources, £1149 14s. 4d.

SOCIETIES AND ACADEMIES.

LONDON.

Physical Society, October 30.—Captain Abney, President, in the chair.—Special general meeting.—The Secretary having read a summary of the replies sent by members to a circular which had been addressed to them during the last session, a series of resolutions drawn up by the Council, bearing on the points raised by this circular, were adopted. The chief of these resolutions were to the following effect: (1) That the subscription to the Society be raised to £2 2s. (2) That present life-members be invited to voluntarily subscribe £1 1s. annually to the funds of the Society, or to compound for this annual contribution. (3) That a guarantee fund be instituted. (4) That in future members of the Society be styled Fellows of the Physical Society of London. In the course of the discussion on these resolutions the President, Secretary, and Treasurer gave an account of the financial position of the Society, and explained that at present each member receives from the Society, in the shape of Proceedings and Abstracts, printed matter which costs the Society more than the amount of the annual subscription. The ordinary science meeting was then held.—A letter was read from Lord Kelvin thanking the Society for the address which the President, on their behalf, had recently presented to him.—Prof. W. Stroud read a paper, by himself and Mr. J. B. Henderson, on a satisfactory method of measuring electrolytic conductivity by means of continuous currents. The method consists in placing a balancing electrolytic cell in the arm of the Wheatstone's Bridge adjacent to the arm containing the chief electrolytic cell, so that the electromotive force of polarisation in the two cells neutralise each other's effect on the galvanometer. The authors find that if the resistance of the arms of the bridge are high (20,000 ohms), and if an E.M.F. of about 30 volts is used in the battery circuit, then the resistance of a solution (of potassium chlorate in their experiments) can be determined to within about one part in two thousand. With a D'Arsonval galvanometer the balancing cell is so efficacious that it is impossible to tell that it is not a metallic resistance that is being measured. Prof. Perry asked if the authors had tested whether the difference in resistance of the two cells was proportional to the difference in length of the liquid columns. Mr. Appleyard said he had found that the resistance of an electrolyte appeared to vary, because in the ordinary arrangement the cell was short circuited through the arms of the bridge. He suggested as a remedy the making and breaking of the circuit by a special key so arranged that, except when taking a reading, the cell is on open circuit. Mr. Blakesley asked if the authors had tried the method in which the resistances are adjusted till, when the battery circuit is broken, there is no immediate change in the galvanometer deflection. It is possible by this method to measure a resistance of between 6000 and 10,000 ohms to within 0.1 per cent. Prof. Ayton said the method referred to by Mr. Blakesley was the ordinary "false zero" method. In using this method you were working to a continuously altering zero; in Prof. Stroud's method, however, the zero was constant. Mr. Appleyard said he had found the "false zero" method troublesome to use. Prof. Stroud, in reply, said they had not tested the proportionality between the resistance and length, and they had not tried the "false zero" method.—Mr. Appleyard then exhibited a number