

THE ROYAL SOCIETY'S CONVERSAZIONE.

THE first of the two soirées held annually at the Royal Society took place on Wednesday, May 3. There was a large collection of apparatus and many interesting exhibits, but our space only permits us to refer to some of those which attracted most general attention; these are as follows:—

Mr. Thomas Andrews, F.R.S., exhibited microscopic structure of heavy steel guns, projectiles, and warship propeller shafts.

The Tsetse Fly Committee of the Royal Society showed enlarged photographs, taken by Surgeon-Major Bruce, illustrating districts in South Africa affected by the Tsetse Fly Disease.

Mr. A. Mallock exhibited thin films used as mirrors. The films are formed by allowing a solution of pyroxylene in amyl acetate to spread on the surface of water. The films being removed when the solvent has evaporated, are then stretched over rings, whose edges have been ground to a true plane, and silvered.

Dr. Patrick Manson and Surgeon-Major Ross exhibited the development of *Filaria nocturna*, Manson, and of *Proteosoma grassii*, Labbé (one of the parasites of malaria of birds), in the mosquito.

Prof. W. N. Hartley, F.R.S., and Prof. J. J. Dobbie exhibited photographs of absorption spectra of organic compounds, showing the method of investigating peculiar cases of isomerism called tautomerism or desmotropy.

Mr. Edwin Edser showed the phase-change associated with the reflection of light from a fuchsine film. Two unsilvered glass plates, forming the end mirrors of a Michelson interferometer, are provided with films of fuchsine on their back surfaces. A horizontal strip of fuchsine is removed from one of the mirrors. Interference fringes are produced by means of rays of light reflected from the fuchsine films; these fringes are focussed on the slit of a spectroscope. The resulting spectrum is found to be crossed by vertical dark bands. In the violet and blue, the bands formed by reflection, in the glass, from fuchsine and air respectively, are seen to be continuous. Since fuchsine is optically less dense than glass for blue light, this is in agreement with theory. Passing onward toward the red end of the spectrum, a gradual displacement occurs in the bands produced by the light reflected from the fuchsine. Red light is seen to be retarded by half a wave-length when reflected from fuchsine.

Mr. Shelford Bidwell, F.R.S., exhibited experiments demonstrating multiple vision; Mr. James Swinburne, Nernst electric lamps; Dr. Woodward, F.R.S., a selection of zoological specimens from Christmas Island (Indian Ocean), collected by Mr. C. W. Andrews; Dr. Francisco P. Moreno, Director of the La Plata Museum, Argentine Republic, portion of skin of an extinct ground-sloth, named *Neomylodon listai* by Ameghino, from a cavern in Southern Patagonia; and Dr. G. Herbert Fowler, examples of floating organisms from the surface and deep water of the Faeroe Channel.

Sir W. Crookes, F.R.S., exhibited new photographic researches on phosphorescent spectra. It has long been known that certain substances enclosed in a vacuum glass bulb phosphoresce brightly when submitted to molecular bombardment from the negative pole of an induction coil. The ruby, emerald, diamond, alumina, yttria, samaria, and a large class of earthy oxides and sulphides emit light under these circumstances. Examined in a spectroscope, the light from some of these bodies gives an almost continuous spectrum, while that from others, such as alumina, yttria and samaria, gives spectra of more or less sharp bands and lines. The exhibitor showed photographs of a group of lines high up in the ultra-violet region, characteristic of a new element associated with yttrium, and separated by long fractionation. To this element the name Victorium has been given. The atomic weight of Victorium is probably near 117. In the purest state in which it has yet been prepared, Victoria is of a pale brown colour.

The Marine Biological Association showed (1) methods of feeding of marine animals, illustrated by living and preserved examples; (2) charts illustrating the distribution of the fauna and bottom-deposits near the thirty-fathom line from the Eddystone Grounds to Start Point.

Mr. Adam Hilger showed the Michelson echelon grating spectroscope.

Prof. Arthur Thomson exhibited a model to illustrate how natural curliness of the hair is produced. Three factors require

consideration in the production of curly hair: (1) the hair shaft, (2) the hair muscle, and (3) the sebaceous gland. Straight hair is always circular on section, and is usually thicker than curly hair, which is ribbon-like and fine. In order that the muscle may act as an erector in the hair, it is requisite that the shaft of the hair embedded of the skin should be sufficiently strong to resist any tendency to bend; unless this be so the lever-like action necessary to produce its erection is destroyed. When the hair is fine and ribbon-like, the shaft is not sufficiently stout to resist the strain of the muscle and naturally assumes a curve, the degree of curvature depending on the development of the muscle, the resistance of the hair, and the size of the sebaceous gland. The curve thus produced becomes permanent and affects the follicle in which the hair is developed, the softer cells at the root of the hair accommodate themselves to this curve, and becoming more horny as they advance towards the surface, retain the form of the follicle, the cells on the concave side of the hair being more compressed than those on the convex side. In this way, the hair retains the form of the follicle after it has escaped from it.

Dr. Sorby, F.R.S., showed (1) Actinæ and other marine animals killed by menthol and preserved in formalin in a fully expanded condition, and the same mounted as transparent lantern slides. The addition of a little menthol to sea water in which the animals are living causes them to expand very fully, and in many cases to die so. When completely dead they can be transferred to 4 per cent. formalin, and kept thus distended or mounted in balsam as lantern slides. (2) Various marine animals preserved as museum specimens in strong glycerine.

Prof. E. A. Schäfer, F.R.S., exhibited (1) specimens showing that after hemisection of the spinal cord Clarke's column undergoes atrophy on the same side below the lesion; (2) specimens showing that the fibres of the pyramidal tract terminate at the base of the posterior horn and in Clarke's column, and not in the anterior horn; (3) specimens showing that the fibres of the descending antero-lateral tract terminate in the anterior horn.

Prof. H. L. Callendar, F.R.S., exhibited recording pyrometers—platinum and thermo-electric.

Mr. W. Duddell showed an oscillograph for tracing alternate-current wave-forms. This oscillograph is arranged for tracing the wave-forms of potential difference and current in investigations with alternating currents. It is essentially a galvanometer which has the extremely short periodic time of one thousandth (0.0001) second, and which is perfectly dead-beat, and has a sensibility, as arranged, of 300 mm. per ampere.

Prof. Hele Shaw and Mr. A. Hay showed how lines of force in a magnetic field could be determined by the stream lines of a thin film of viscous fluid, and also plotted from mathematical investigation.

Prof. W. F. Barrett showed a new thermo-electric combination, giving a nearly constant electromotive force through a wide range of changing temperature.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—A meeting of the Junior Scientific Club was held on May 6. Mr. E. H. J. Schuster (New College) exhibited some excellent lantern slides of shore life.—This being the 200th meeting, Mr. G. C. Bourne (New College) read a very interesting paper on the early constitution of the Club, after which the Club adjourned. The officers for the ensuing term are—President, E. Gurney (New College). Secretaries, A. G. Gibson (Christ Church), H. E. Stapleton (St. John's). Treasurer, F. W. A. Fleischmann (Magdalen). Editor, F. W. Charlton (Merton).—Owing to medical advice, Prof. E. Ray Lankester, F.R.S., finds that he will be unable to deliver the Boyle Lecture of this year. Prof. J. G. McKendrick, F.R.S., has consented to take his place, and will lecture on "Musical sensations and the inner ear" on June 13.

CAMBRIDGE.—Prof. Sims Woodhead will deliver an inaugural lecture on the relations of pathology to modern medicine, in the Anatomy Theatre on May 23, at 2.30 p.m.

Mr. P. T. Main (sixth wrangler, 1862), who was for many years Lecturer in Chemistry and Superintendent of the Laboratory of St. John's College, died in his rooms on May 5.

The examinations in Agricultural Science for the University's diploma will extend from June 12 to June 19.

On November 7 two groups of colleges will hold examinations for entrance scholarships and exhibitions in Natural Science. One group includes Pembroke, Caius, King's, Jesus, Christ's, St. John's, and Emmanuel; the other Trinity, Clare, and Trinity Hall. The scholarships are of the value of 80*l.* a year and under. At the first group the subjects of examination are: (1) chemistry, (2) physics (including dynamics and hydrostatics), (3) physical geography (as introductory to geology), (4) animal physiology, (5) biology (including zoology and botany). In all branches of Natural Science there will be an examination in practical work. No candidate will be examined in more than *three* of the subjects numbered (1) to (5). Candidates who wish to offer elementary biology as a subject will be examined by means of the more elementary questions contained in the papers on biology. Opportunity will be afforded to candidates in biology to give evidence of their knowledge of natural history, and opportunity will also be given to candidates in physics to show proficiency in mathematics by means of a paper of a somewhat more advanced character than the *test paper* in mathematics. Those who wish to be examined in physical geography or physiology must give notice to that effect not later than October 23.

Information as to the range of the examination in physical geography may be obtained on application to any of the colleges.

At the second, the subjects are physics and chemistry. Papers will also be set in zoology, botany, physiology, geology, or other tripos subjects, provided that notice be given to the tutor not later than October 10. The notice should be accompanied by a list of the text-books which have been read by the candidate. Candidates for an emolument at Clare College may also offer elementary biology.

Further information may be obtained from any of the college tutors.

THE International Congress on Commercial Education was opened at Venice on Thursday last in the Senate Hall of the Doges' Palace. Signor Pascolato, the president, delivered the opening address, in which he bade the foreign representatives cordially welcome. Dr. L. Saigant, representing France, gave a review of the work accomplished in the five previous congresses on commercial education, and thanked the Government and the King and Queen of Italy for the reception accorded to them. Other speeches followed. At the afternoon sitting, the Congress discussed the subject of a commercial school, its purpose, its limits, and its organisation. Other cognate subjects were considered at subsequent meetings. The next Congress will be held in Paris in August 1900.

THE Committee of Council on Education in Scotland has resolved that a sum not exceeding 2000*l.* shall be added to the amount payable under the "Education and Local Taxation Account (Scotland) Act, 1892," towards defraying the cost of the inspection of higher class schools in Scotland, and of the holding of examinations for and granting the leaving certificates of the Scotch Education Department. They have also resolved that a sum not exceeding 2000*l.* shall be set aside for the further encouragement of agricultural education in Scotland, to be distributed on conditions which shall hereafter be set forth by the Scotch Education Department. The remainder of the balance available under the section is to be applied in aid of such higher class secondary or technical schools in Scotland as are not in receipt of grants under the Scotch Code.

In the House of Commons on Monday, Mr. Gerald Balfour introduced a Bill to establish a Department of Agriculture and other Industries and Technical Instruction in Ireland. Describing the principal provisions of the Bill, the right hon. gentleman stated that, as far as concerned the transfer to the new department of existing Governmental functions, the measure closely resembles its predecessor, but that to the powers and duties formerly proposed to be transferred are now added those of the fishery inspectors and most of the functions exercised by the Science and Art Department. With regard to the machinery and funds for carrying out the work of developing agriculture and other industries, considerable changes have been introduced, and the provisions with respect to technical instruction are new. For the purposes of the Bill there will be placed at the disposal of the department, in addition to certain moneys annually voted by Parliament, a total income of between 160,000*l.* and 170,000*l.* a year. It is proposed that the chief sources of this income shall be the Imperial Exchequer, the Irish Church Fund, and the savings effected under the Judicial

Act of 1897. 55,000*l.* is to be allocated to technical instruction of an urban character, and 10,000*l.* will go to purposes connected with sea fisheries. The rest of the money is to be used in connection with rural industries. The department is to be assisted by an agricultural board and a board of technical instruction, and only a minority of the members of these boards will be nominated by the Government. It is to be a general rule that no money is to be spent by the department in any local object without some contribution from local sources. The Bill was read a first time.

IN an address to students of the London Society for the Extension of University Teaching, delivered on Saturday afternoon in the Mansion House, Dr. Hill, Master of Downing College and Vice-Chancellor of the University of Cambridge, made the following remarks with reference to science teaching:—The too early teaching of science is not productive of permanent excellence in that department. The classical boys do far better, for they approach the new subject with an intelligence well drilled, with mental sinews well exercised and developed. The true way of approaching science at school is not to prepare boys for science scholarships, but to let scientific interests run like a thin line through school life—to induce a love of nature and beautiful objects. Experience in examining for the science tripos and the medical examinations is discouraging, and, astonishing as is the knowledge of facts displayed by candidates, their mental grip and conception of principle are unsatisfactory. But it is still to be remembered that a wrangler cannot be turned into a biologist, and mathematics dealing with abstractions are not well calculated to make a man a good observer of nature. The qualities needed for a man of science are many—quickness of observation, tenacity of memory, ratiocinative power—and no one course of study can be trusted to produce those results. The individual, however, is the main element, and there is needed in the several cases presented as great variety of mental as of physical nutriment for the body. In any case, however, wide sympathies are needed; the literary man would be the better for some knowledge of science, and the scientific man for a keen interest in literature. The University is charged sometimes with undue extension into technical subjects—to make men farmers, brewers, lawyers, and the like. It is not so, but the University desires to imbue the farmers and others who came to her with a love of knowledge, an elevated taste, a highly trained intelligence.

A GENERAL meeting of Convocation of the University of London was held on Tuesday, Mr. E. H. Busk, chairman of convocation, presiding. The *Times* reports that the Chairman, in replying to Prof. Silvanus Thompson, stated he could not say that, in the ordinary use of the word, negotiations were in progress for the transference of the business of the University to the Imperial Institute. If there were negotiations in progress they were only in a preliminary stage. The position of the matter was this. A communication was received from the Government requesting that a conference might take place between three representatives of the Treasury, three representatives of the University, and three representatives of the Imperial Institute—nine persons in all, who were to inspect the buildings and the grounds belonging to the Imperial Institute at South Kensington, and to consider whether those premises either were suitable or could be made suitable for the headquarters of the University in any way; and, if so, it was thought that the Government might enter into an arrangement with the authorities of the Imperial Institute which would enable them to make a proposal to the University. The nine representatives were duly appointed; they had inspected the building, but they had not yet reported.—Dr. H. F. Morley moved the reception of the report of the standing committee dealing with the regulations at the matriculation examination, and recommending various resolutions for adoption by Convocation. The report was received. Dr. Morley then moved a resolution requesting the Senate to adopt for the matriculation examination a scheme of subjects which was in complete accordance with the scheme that was unanimously adopted by the meeting of delegates from the Board of Studies in the Faculty of Arts. After some discussion the scheme of subjects was adopted by the house in the following form:—(1) Latin (two papers); (2) English (two papers); (3) mathematics (two papers); (4) any two of the following five languages:—Greek, French, German, Sanskrit, Arabic; and (5) one of the following five sciences:—Elementary mechanics, elementary chemistry, elementary sound, heat, and light, elementary magnetism and electricity, and elementary botany.