

at the Society of Arts. Yet we would point out that, in the first place, he divided the stages he had under consideration into (1) wood stages, (2) wood-and-iron stages, and (3) iron stages; and that he then again subdivided them according to the power used for moving the scenery, or obtaining certain effects, be it manual labour, hydraulics, or electricity.

In speaking of the wood stage of the metropolis, Mr. Sachs naturally does not omit to refer also to the wood stage of the Continent, which is but little better than our own; nor when he spoke of the wood and iron stage of Paris did he omit to speak of our "Palace" Theatre of Varieties, which is the solitary example of a theatre in this country in which a combination of wood and iron is to be found. When Mr. Sachs, however, came to speak of the iron stage, and more especially the iron stage worked by hydraulics or electricity, he had to confess that there was not a single iron stage to be found throughout the United Kingdom, that there was no stage worked by electric machinery, and that the only appliances in which hydraulics are being employed in this country were some so-called "bridges" at Drury Lane. But on the continent, the iron stage, with all its improvements for lighting, for showing a curved horizon, and—to summarise—for giving some semblance of nature, is already to be found in considerable numbers and of considerable variety.

By Mr. Sachs's courtesy we are able to show two illustrations—one of the great electrical turntable stage for Munich, so useful for Shakespearean drama, where a quick change of scene is desirable, and the other of a hydraulic stage at Vienna worked on the suspended system. In the first case a general view is shown which well describes itself. In the latter case a view of the "gridiron" is shown, which plainly indicates the modern forms of wiring adopted.

But we cannot go further into the technical detail of the question, and we only trust that Mr. Sachs's words will have had some effect on the many managers and stage engineers who had come to hear him, not forgetting Herr Kranich, from Bayreuth, one of the leading exponents of scenic mounting on true art lines.

But whatever may have been the influence of Mr. Sachs's advocacy, we would end by quoting him where he said "that the real secret of perfect scenic art lies in illusion, *i.e.* in visual deception, or in not allowing the eye of the spectator to discern the means whereby the semblance of reality is obtained; mere actuality will not accomplish this—crude realism alone would then result."

What the scenic artist and the stage-manager must attempt, according to Mr. Sachs, is to obtain a successful illusion; and this, he argues, is obtainable, not by any great *radical* reform, as desired by irresponsible faddists, but a *practical* reform of the methods and appliances which are to-day used on the stage of the metropolis, and which are, unfortunately, quite a hundred years too old.

Why should not our stage have the full benefits of science and art as practised now on the approach of 1900 A.D., instead of the makeshifts with which the world was satisfied at the beginning of the last century?

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—Want of accommodation in more than one department of the University museum renders it impossible to carry on satisfactory work. The extracts printed below, from the report of the delegates of the museum, tell of a condition of "hope deferred, which maketh the heart sick." Prof. J. Burdon-Sanderson reports:—"The Regius Professor of Medicine takes this opportunity of expressing his bitter disappointment that another year has been allowed to pass without any step having been taken towards providing adequate accommodation for the teaching of medical science in the University. It is in his judgment to be feared that if the reasonable requirements of the medical school continue to be disregarded, its further development will be checked, and that the progress of those departments of teaching which have common interests with it will be seriously interfered with." Prof. R. B. Clifton, Professor of Experimental Philosophy, says: "Some electrical apparatus has been placed in the room formerly allotted to the professor as a private laboratory, and with that in the room devoted to the electrical work of the preliminary classes, it is now possible to offer some, though very

restricted, facilities to Honour students who wish to gain experience in the methods of measuring electrical quantities. The professor and demonstrators have now, however, no place in which they can carry on research; and all attempts to undertake work of this character must in future be abandoned. After twelve years of fruitless effort to obtain extended accommodation for Honour students, and the means of providing for the increasing number of those working for the preliminary examination—a class of students not contemplated when the laboratory was designed—it is probably quite useless to trouble the delegates with any further application for assistance in this direction." It will be difficult for men of science on the Continent and in the United States to believe that so little encouragement is given to scientific work in the University of Oxford.

The 191st meeting of the Junior Scientific Club was held in the physiological lecture-room of the museum on Friday, June 10. After private business, Mr. V. H. Veley, F.R.S., read a paper on *Colcothrix methyestes*, the active micro-organism which Mrs. Veley and himself recently discovered in "fauly" rum, and, it is hoped, will shortly form the subject of a monograph. After the paper a discussion took place, in which Dr. Ritchie and others joined.

CAMBRIDGE.—Mr. A. E. H. Love, F.R.S., of St. John's College, has been appointed University Lecturer in Mathematics in the room of Mr. Glazebrook, resigned.

The Senior Wrangler this year is Mr. R. W. H. T. Hudson, of St. John's College, son of Prof. W. H. Hudson, of King's College, London. Miss Cave-Browne-Cave, of Girton, is bracketed fifth wrangler.

The Vice-Chancellor announces that donations amounting to over 6000*l.* have been received for the University Benefaction Fund, started last year. A large number of the donations are ear-marked for the Medical School. A bequest of 10,000*l.* has also fallen to the University, but it is assigned to the foundation of a prize or scholarship in memory of the late Dr. Allen, Bishop of Ely.

Mr. C. F. Hadfield, of Trinity, and Mr. R. C. Punnett, of Caius, have been nominated to the University tables at the Naples Zoological Station; and Prof. E. W. MacBride, of St. John's, to the table at Plymouth.

The General Board propose that Mr. W. N. Shaw, F.R.S., should be appointed assistant-director of the Cavendish Laboratory for the ensuing year, in the place of Mr. Glazebrook.

DR. R. A. HARPER has been appointed professor of botany at the University of Wisconsin.

At a meeting of the Court of Edinburgh University on Monday a letter was read from a benefactor of the University, intimating that he is prepared to give to the University such a sum as may be necessary, but not exceeding 10,000*l.*, to build and equip a laboratory and class-room to be used exclusively for the teaching of public health, the site of the proposed building to be provided by the University.

THE foundation-stone of a separate department for instruction in the technology of the leather industries, was laid at the Yorkshire College, Leeds, on Monday. The ceremony was performed by Mr. A. B. Kent, Warden of the Skinners' Company of London, who have provided 5000*l.* in order to establish this department, and will contribute towards the working expenses.

THE new laboratories of physiology and pathology at the University College, Liverpool, will be formally opened on October 8. The laboratories have been erected and equipped in the most adequate way for study and research by the Rev. Thompson Yates, at a cost of 25,000*l.* Lord Lister, President of the Royal Society, has consented to perform the opening ceremony; and the Victoria University will take advantage of his visit to Liverpool to confer upon him the honorary degree of doctor of science.

AT the Science and Art Department on Friday last a conference was held of organising secretaries and other representatives of local organisations which have been recognised by the Department as responsible for science and art instruction within their several districts. The Vice-President of the Committee of Council on Education (Sir John Gorst) presided, and the conference was attended by representatives from a number of

ounties. Various matters connected with the administrative arrangements between the local authorities and the Department were considered and decided.

At the instance of the Headmasters' Conference, the Headmasters' Association, the Headmistresses' Association, and the Conference of Catholic Schools, a Bill dealing with the subject of secondary education will be introduced into Parliament this Session. The Bill proposes to transfer the powers relating to secondary education now vested in the Charity Commission, the Science and Art Department, and the Education Department to one central authority under the Committee of the Privy Council on Education, and to establish local secondary education authorities to administer areas not less than those of a county or a county borough. It is contemplated that the reconstituted Education Department will consist of two sections, for secondary and primary education respectively, these two sections being under one permanent secretary, who will be advised by chief assistant secretaries in regard to each of these two chief divisions of departmental work. The Bill further provides for the registration of secondary schools according to their different types and of teachers qualified to teach. The residue under the Local Taxation (Custom and Excise) Act, 1890, is to be allocated to education, and in the case both of residue and of Imperial grants now paid through the Science and Art Department such portions as the Treasury shall determine are to be allocated to secondary education and to technical instruction respectively.

THE new buildings of Reading College, under which name the University Extension College at Reading will in future be known, were opened by the Prince of Wales on Saturday. The College was established in 1892 as a direct outcome of Oxford University Extension work. Mr. H. J. Mackinder was appointed Student of Christ Church, Oxford, his appointment being made "with a view to giving system and completeness" to the educational work of one of the University Extension centres. His services were offered to Reading, and were accepted; and, largely owing to his efforts during the past six years, the College has advanced to the position it now occupies. The first home of the College was restricted to an ancient building, formerly part of the Hospital of St. John, attached to the Abbey of Reading. The accommodation was soon found to be insufficient for the increasing number of students. Mr. Herbert Sutton, chairman of the Council, purchased the vicarage of St. Lawrence, adjoining the Hospitium, and the acquisition of this property enabled certain necessary enlargements to be made, including the building of a dairy institute. The cost of the College properties and buildings exceeds upwards of 20,000*l.*; and it was this amalgamation of old and new buildings in one central educational organisation, to be known as Reading College, that the Prince of Wales formally opened on Saturday. In responding to the toast of "The Royal Family," at the luncheon after the opening ceremony, the Prince of Wales remarked:—"In the work we have done to-day, we have inaugurated an institution which has for its object the advancement of higher education, especially in those branches more particularly connected with science, art, and agriculture. To me this is particularly interesting on account of the early associations which render it a matter of interest to know that the new College owes its inception and encouragement to the University of Oxford, and to Christ Church, my old College. The presence of the Vice-Chancellor of Oxford and of the Dean of Christ Church, as well as the attendance of many other eminent men from Oxford, is a proof of the interest they take in this movement. Let me mention that the heads of colleges and the Hebdomadal Council have satisfied themselves of the high standard of efficiency of the education in Reading College, and have agreed with great liberality to affiliate Reading College to the parent University to the extent of conferring on it the privilege of allowing students, after spending three years at Oxford and passing certain scientific examinations there, to proceed to Reading, where one year's further study in the science and practice of agriculture should count as part of their University career, and entitle them to the B.A. degree on the completion of their full course. This proposal, although supported by a large and influential University, was, on a division, rejected by two votes, the numbers being 47 to 45. The interest which I take in University Extension teaching, which now includes agriculture, leads me to hope that another year may see the adoption of the important policy advocated by the important bodies to which I have alluded, and that its provisions may be carried through the subsequent stages to render it law."

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SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, May 12.—"The Electrical Response of Nerve to a Single Stimulus investigated with the Capillary Electrometer." Preliminary communication. By F. Gotch, M.A., F.R.S., Professor of Physiology, University of Oxford, and G. J. Burch, M.A. (Oxon).

By means of a very sensitive capillary electrometer the authors have obtained photographic records of the electrical response in the sciatic nerve of the frog when excited by a single stimulus. The records differ in character according to the condition of the nerve. In uninjured nerve a rapid displacement of the meniscus in one direction is followed by a corresponding displacement in the other direction. In nerve which is the seat of a persistent electromotive change, whether through local injury or the passage of an appropriate polarising current, the record shows that the initial rapid displacement is succeeded by a prolonged after-effect of similar sign. The records are sufficiently pronounced to allow of the calculation of the E.M.F. of the potential difference between the electrometer contacts causing the initial displacement; this may reach as much as 0.032 volt, and attains its maximum very rapidly. In fresh nerve at 6° C. the first indications of such electrical change occur 0.002 second after the single stimulus has been applied at a distance of 30 mm. from the capillary contacts. The after-effect develops more slowly, taking from 0.006 to 0.01 second to culminate, its maximum E.M.F. is only one-tenth that of the initial change, and it subsides slowly; it is present in every nerve when one of the capillary contacts lies upon the cross section of the nerve.

"On the Magnetic Susceptibility of Liquid Oxygen." By Prof. J. A. Fleming, F.R.S., and James Dewar, F.R.S.

May 26.—"Note on the complete Scheme of Electrodynamical Equations of a Moving Material Medium, and on Electrostriction." By Joseph Larmor, F.R.S., Fellow of St. John's College, Cambridge.

This paper (in continuation of previous memoirs) undertakes in general form the exact expression of the electrodynamic relations of moving media which are polarisable, or are in motion through the æther. No foundation is available from which to investigate the modification that the ordinary equations of MacCullagh and Maxwell must then undergo, without going back to molecular theory. When that is done the crucial point in the investigation is the transition from a theory concerned with the individual molecules to a mechanical theory concerned only with the element of volume: this requires a separation between the influence of neighbouring molecules which affects only the structure of the material at that place, and the influence of the matter in general which induces polarisation and mechanical strain in the structure. It is shown that to express the influence of magnetic polarisation of the material, and also the influence of convection of electrically polarised material, these agencies must be replaced analytically by equivalent distributions of electric current. The resulting scheme of equations is wide enough to include the whole field of electrical and optical phenomena in continuous bodies, whether fixed or in motion, of which various cases are again incidentally considered.

Physical Society, June 10.—Mr. Shelford Bidwell, President, in the chair.—Dr. S. P. Thompson described and exhibited a model illustrating Max Meyer's theory of audition. Max Meyer abandons the audition theory of Helmholtz, and contends that analysis takes place in the ear otherwise than by resonance of the Corti organ. Imagine a jointed system, like a hand, to be oscillated from one end, *i.e.* from the finger-tips. A small motion affects only the top joints, but a large motion affects the whole structure. Such a structure is the membrane of the inner-ear. It widens towards one end, and is effectively damped by the contained liquid. Wave-motions of different amplitudes run along it to different distances before they are extinguished; these distances are recorded by nerves, and are thereby communicated to the Corti organ. In the model, the compound-wave to be analysed is cut out on the edge of a disc of zinc, so that, as the disc revolves, the motions are communicated to a frame-work. If the frame is thus moved through more than a certain distance, a displacement occurs which sets a second frame in motion, and so on to a third and fourth. The depth to which the motion penetrates is indicated by a series of glow-lamps connected electrically to the frames. Prof. Ayrton said it had for some time past occurred to him, when consider-