

four reached a height sufficient to require trigonometrical determination. These were a Hargrave kite, of rhomboidal cross section, with four bands of linen, by Mr. S. H. R. Salmon; a kite of special design, by Mr. S. F. Cody, having the appearance in the air of a very large bird; a similar kite by Mr. L. Cody, and a Burmese kite by Mr. Charles Brogden.

In the course of an hour, four sets of observations were obtained for each kite, and were subsequently computed by Mr. Mason, of King's College, London, in accordance with a systematic programme drawn up by Prof. C. Vernon Boys.

As the result of the calculations, it appears that the greatest height measured for Mr. Salmon's kite was 1250 feet, for Mr. L. Cody's 1476 feet, for Mr. Brogden's 1816 feet, and for Mr. S. F. Cody's 1407 feet, and, therefore, none reached the minimum height required for the award of the medal. This unfortunate result was probably due to the fact that the wind, which had gradually increased from a light air as the sunshine continued, was a surface wind, and fell off in strength at some little height above the surface. The average heights of the several kites from the four observations of each were 1189 feet, 1271 feet, 1554 feet, and 1326 feet respectively.

At 4.45 the signal was given to haul in the kites, and all but one were safely brought back. The wire of this one had become entangled in the trees, and the kite was still in the air when the majority of the visitors had left the ground. The winding gear was in each case hard gear.

The supervision of arrangements for the competition was entrusted to a jury consisting of Dr. W. N. Shaw, F.R.S. (chairman), Prof. C. V. Boys, F.R.S., Mr. E. P. Frost, J.P., D.L., Sir Hiram Maxim, Dr. Hugh Robert Mill, Mr. E. A. Reeves, and Mr. Eric Stuart Bruce, secretary of the Aeronautical Society.

The society and its energetic secretary are to be congratulated upon having carried out successfully a series of arrangements that were necessarily elaborate, and not free from difficulties of many kinds.

THE CELTIC GOLD ORNAMENTS.

THE decision in the Court of Chancery that the gold ornaments from the north of Ireland, and bought as long ago as 1897 by the British Museum, are treasure trove, and, therefore, are to be taken from the Museum and handed over to the King, will produce a curious effect on the mind of the intelligent foreigner. But when he is told that the action at law is due to the persistent claims of the irreconcilable Irish party, he will probably begin to understand the position, from analogous conditions in his own country. The whole affair is to be regretted, but it must in fairness be stated that the entire blame lies at the door of the Irish executive, and that but for their incomprehensible apathy in making no effort to secure the ornaments before the British Museum ever entered the field, there would have been no need for a costly lawsuit. There is, however, a wider application of this particular example, arising from the contention of the Irish archæologists that all antiquities found in Ireland must remain there. Foreign students coming to an institution like the British Museum will expect to find there, primarily, an adequate representation of the archæology of the British Islands—surely not an unreasonable expectation in the central museum of the Empire. But if the Irish contention is to prevail, Scotland will claim equal rights, and Wales also when it decides on a capital for the Principality, so that the earnest student, not generally a wealthy individual, will be compelled to seek out

what he wants in widely separated cities. There are, of course, arguments in favour of such a course; but, as a practical matter, there are, in fact, ancient remains enough in these islands to admit of the central museum having a fair comparative series, without in any way damaging the local museum. A little mutual understanding is all that is wanted, and it is to be hoped that the parochial idea that seems to prevail in Dublin will not be thought worthy of Edinburgh. London, after all, is the capital of these islands, and, for one foreign or English student in Dublin or Edinburgh, there are fifty, or, may be, a hundred, who work in London. The greater the number of workers, the greater will be the benefit to science.

THE UNIVERSITY OF LONDON.

THE presentation of degrees at the University of London, which took place as we went to press last week, was noteworthy in several respects. Honorary degrees were conferred for the first time in the history of the university, the recipients being the Prince and Princess of Wales, Lord Kelvin and Lord Lister; and representatives of the many and various institutions and organisations which are connected with the university, or are promoting its development, were also assembled together for the first time.

In his report on the work of the university during the year 1902-03, the principal, Sir Arthur Rücker, gave a short description of the educational scheme of the reconstituted university, beginning with arrangements which are primarily intended to be of benefit to those who are not aiming at degrees, and proceeding through the various stages of a university course to post-graduate study and research.

The following are some of the points of general interest mentioned in the report:—

Relation of the University to Schools.—The matriculation examination of the University of London has for many years served some of the purposes of a school-leaving examination. Persons who had passed it were excused by various professional bodies from their own entrance examinations; and for this or other reasons the examination was taken by many candidates who did not intend to pursue a university career. On the other hand, the Senate has for long included the examination of schools among its duties, and of late it has been felt that the time has come for performing this work on more modern lines and on an extended scale. A scheme has therefore been approved by the Senate for the inspection of schools, and the university has been recognised by the Board of Education as an authority under the Board for that purpose. This inspection will include an inquiry into the aims of the school, a consideration of its curriculum and arrangements as adapted to those aims, an inspection of the school buildings and fittings, and of the teaching work of the staff as tested by an inspection of the classes at work.

Entrance to the University.—The first matriculation examination under the new scheme took place in September last. It is a real matriculation examination in the sense that no candidate can begin his university career until he has passed it. It represents the minimum standard of admission to the university, and is intended to be such that it can be passed without special preparation or cramming by a well-educated boy or girl of about seventeen years of age.

The Senate has agreed to waive the matriculation examination altogether in the case of graduates of a large number of approved universities, and of persons who have passed the Scotch leaving examination or hold the *Zeugniss der Reife* from a Gymnasium or Real-Gymnasium within either the German or the Austrian Empire. A large number of persons have availed themselves of this privilege, which will be particularly valuable to those who may intend to supplement a degree taken at another university by study in London.

Courses of Study for Internal Students.—The distinction between an internal and an external student is that, while the latter can obtain a degree on passing certain prescribed examinations, the internal student must not only pass examinations but also produce certificates that he has attended courses of instruction approved by the university and controlled by recognised teachers.

The case of evening students has received special consideration. The hours of compulsory attendance are reduced in the case of those who submit certificates that they are engaged in some business occupation for twenty-five hours a week. The time required for the complete course varies with the subjects chosen, but in general the reduction allowed makes it possible for a student giving some three evenings a week to attendance on lectures and laboratories to complete a degree course in four years. It is satisfactory to be able to state that the regulations under this head are working smoothly at the polytechnics.

Organisation of Teaching.—It is not, however, only by curricula and arrangements as to examinations that the work of a teaching university must be carried on. It is also necessary to extend, organise, and coordinate the work of the teachers. This task requires funds, and also the cooperation of the various schools and other institutions connected with the university.

The Senate has approved a scheme for the establishment in the neighbourhood of the university of an institute of preliminary and intermediate medical studies, which has the support of the Faculty of Medicine, and has authorised the issue of an appeal for its building and endowment. When this is carried out, some, at all events, of the medical schools will be relieved of the necessity of maintaining independent courses of instruction on subjects which are only ancillary to medicine, and need not be studied in the immediate vicinity of a hospital. For the realisation of this project a large sum of money is required, but there can be no doubt that it will be an addition of the first importance to the equipment of London as a centre of medical study.

The attention of those interested in the teaching of engineering has been drawn to the proposals made by Mr. Yarrow in support of the system by which students of that subject spend alternate periods of six months in a college and the workshops. It is satisfactory to be able to state that in all probability some of the schools of the university will cooperate with employers in introducing into the metropolis a system of technical education which has worked well elsewhere.

Lastly, it may be added that the negotiations between the university and University College for the incorporation of the college in the university have been brought to a successful conclusion, and a joint committee has been appointed to draft a Bill for giving effect to the agreement. University College has purchased a plot of land in the neighbourhood of the hospital, to which the medical school will be transferred on an independent footing. This step is a necessary preliminary to incorporation, as it is not considered to be desirable that the university should itself control one, and one only, of the numerous medical schools which exist in London.

Post-graduate Work and Research.—The physiological department of the university, which is established in the university buildings, has been at work throughout the year under the direction of Dr. Waller, F.R.S., who has devoted the whole of his time to the interests of the laboratory. It will be remembered that all the principal teachers of physiology in London have banded themselves together to give, in turn, lectures to post-graduate students.

The research work carried on in the laboratory has resulted in the production of eight or ten original papers, which have appeared in English, American, and German periodicals.

The excellent example given by the physiologists has been followed by the botanists, who have in like manner agreed to give courses of post-graduate lectures at the Chelsea Physic Garden, a scheme which has only been made possible by the cordial cooperation of the trustees of the City Parochial Charities.

Gifts to the University.—The first year's payments on account of the grant of 10,000*l.* a year from the Technical Education Board of the County Council have been made, and the various professors and lecturers have been appointed and are now at work.

The Worshipful Company of Goldsmiths has presented to the university the very valuable library of pamphlets and other works relating to economics, collected by Prof. Foxwell, and recently purchased by the Company at a cost of 10,000*l.* To this munificent gift the Company has added considerable sums to aid the university in installing and maintaining the library.

During the year, Mr. G. W. Palmer, M.P., has contributed the sum of 1000*l.* towards the endowment of the physiological laboratory, and Mr. Alfred Palmer has made a contingent promise of a like amount for the same object.

In addition to their former munificent promise of 30,000*l.* in aid of the incorporation of University College in the university, the Worshipful Company of Drapers has presented 1000*l.* to the university, and a scheme is being drafted for the application of this grant to University College.

Apart from the grant of the Technical Education Board of the County Council, about 25,000*l.* has been given to the university by the above-mentioned donors in the course of last year.

Summary.—The foregoing report will, it is hoped, prove that the university is anxious to leave no part of its duties unfulfilled.

New avenues of work have been opened in connection with schools, with university extension, with the colleges, medical schools, and polytechnics; students are entering both for the ordinary matriculation examination and for post-graduate study and research in unexpected numbers. The authorities of the institutions connected with the university have in all cases shown the most anxious desire to work in harmony with it, and to arrange their classes to meet the conditions which the Senate has laid down.

But, while there are many grounds for hope, and while the university is doing its best to make itself worthy of public support, it must be frankly admitted that it can never adequately fulfil its duties without the supply of funds from public or private sources on a very large scale. The incorporation of University College cannot be carried out until another 100,000*l.* has been raised; the complete endowment of the Institute of Medical Sciences would need much more than that amount; the fuller organisation of teaching on lines which have been already adopted in the case of German, and towards which a small beginning has been made in the case of chemistry, would require very large sums. On the one hand, technical instruction is sorely in need of development; on the other, if funds were available, a scheme could be worked out by which students of literature and archaeology might make full use of the magnificent libraries and collections which London possesses.

Lastly, the payment of the professors, which is in many cases very inadequate, and of the cost of their departments, depends so much upon fees and so little upon endowments that the expense of education in London is comparatively high. Those who are engaged in the work are convinced that the one thing needful is endowment adequate to make good the apathy of the past, and to secure the promise of the future. It is for London to say whence and when that endowment will be forthcoming, and to determine whether a university which is providing for all learners, from the evening student to the candidate who has already graduated elsewhere, shall control means and appliances worthy of the highest educational institution in the capital of the Empire.

After the Prince of Wales had been presented for the honorary degree of doctor of laws and the Princess for that of doctor of music, Prof. Tilden, Dean of the Faculty of Science, presented Lord Kelvin for the degree of doctor of science, and in doing so he said:—

My Lord the Chancellor, I present to you William Thomson, Baron Kelvin of Largs, for the degree of doctor of science, *honoris causa*. The illustrious son of a family famous for mathematical talent, for more than half a century Lord Kelvin filled the office of professor of natural philosophy in the ancient University of Glasgow. Two generations have passed since he entered on his professorship, and the advances in physical science which have distinguished the nineteenth century from all preceding epochs have been largely due to the influence of Lord Kelvin in promoting true ideas concerning the conservation of energy, the laws of thermodynamics, and their application to the

mechanics and physics of the universe. His untiring intellectual activity has led him also to inquire into problems interesting to the chemist and geologist, as well as those which are important to the physicist and engineer. He has calculated the probable size of atoms; he has studied the structure of crystals; he has estimated the age of the earth. But the world knows him best as the man who has shown how practically to measure electrical and magnetic quantities, and has made it possible to link together distant continents by the electric telegraph. It is he who has shown how to neutralise the effects of iron on the compasses of ships and how to predict the tides, and who has thus taught the mariner to steer safely over the surface of the ocean and to sound, as he goes, its depths and shallows. A greater philosopher than Democritus, in him are united the qualities of Archimedes and Aristotle. Regarded with affectionate reverence by his contemporaries, it cannot be doubted that his name will shine brightly through long future generations. In offering a place of honour to such a man the university confers lustre on itself.

Mr. Butlin, Dean of the Faculty of Medicine, then presented Lord Lister for the honorary degree of doctor of science in the following terms:—

My Lord the Chancellor, since the reconstitution of the university, the Faculty of Medicine has been almost continuously engaged in arduous and not always pleasant work, and to-night, as if in compensation, there falls to its lot—for I am but the mouthpiece of the faculty—the agreeable task of presenting my Lord Lister for one of the four first honorary degrees of the University of London. While every person in my profession is familiar with the work which he has done, and his name has become a household word in every part of the civilised world, comparatively few persons are acquainted with the obstacles which he has overcome. It is not only that, sitting down many years ago in front of a difficult problem of pathology, Lord Lister solved the mystery which had puzzled the brains of the greatest surgeons of all time, or that he then invented a means of meeting and overcoming surgical infection, but that he stood by his theory, and fought manfully for it, until at length, in spite of opposition, of envy, of lack of faith, and even of ridicule, he succeeded in carrying conviction to the minds of his own profession and of the world at large. And all this was done, and these things were borne, not for the sake of gain—care for which has never been a part of Lord Lister's character—but for the sake of science and for the relief of human suffering. It is well-nigh impossible for those among whom a great man lives to form a just estimate of the value of his work, whether in art or in science, but I venture to predict that the name of Lord Lister will be handed down from generation to generation, from century to century, until, more than 2000 years hence, he will be acknowledged by our descendants as the father of surgery, in like manner as Hippocrates is regarded by this present generation as the father of medicine. I, therefore, sir, beg to present the Right Hon. Lord Lister, and ask you to confer on him the honorary degree of doctor of science, and I do so with the happy confidence that the addition of his name will confer lustre now and in the future on the University of London.

The students who had gained degrees in various faculties of the university were then presented in groups by the Dean of each faculty.

A CHARLOTTENBURG INSTITUTE FOR LONDON.

THE magnificent proposals which Lord Rosebery laid before the County Council in his letter to its chairman, Lord Monkswell, on June 27 have roused feelings of keen interest and high hopes in many who, for years past, have been crying, as it seemed in the wilderness, to the nation, to the Government, to public bodies, and to private individuals to do something to improve our higher technical educational methods. Generally speaking, the cry has been ignored or else met with the reply that

our fathers obtained the command of the sea, extended our commerce and made the country the greatest commercial centre of the world, so surely methods which were good enough for them are good enough for us. Passing strange, but were they content with the methods of their fathers? did the eighteenth century show no advancement upon the seventeenth century? At the beginning of the nineteenth century we were ahead of all nations in the use of gas as an illuminant; later on, our railway systems and our steamships became the envy of the world; other nations could not approach us in engineering. In the middle of the century we were pioneers in many chemical discoveries; but then, apparently, so much prosperity and success seems to have been too rich a diet, and we waxed fat and kicked.

Of late years the country has felt more and more the competition of other nations. The colour industry has forsaken our shores, the finest electrical machinery is made abroad, we go to America for labour-saving appliances. Thinking men have cast about and tried to find a reason why other nations should take our markets; but when it was first suggested that our deficiency in scientific and technical education was at the root of the matter, those who dared to make the suggestion were, if not mocked at, at any rate treated with scant courtesy.

Now, however, it is generally admitted that, unless we improve our educational methods, we shall fall behind in the modern race for advancement to such an extent that it will require almost a miracle for us to be able to pull up again.

Our secondary education is not what it should be, but it is gradually improving. Technical education, generally speaking, has been tinkered at. The polytechnics are doing good work, but they are largely engaged in turning out better workmen and foremen workmen, or taking the place of the old apprenticeship system. Lord Rosebery now comes forward, and, through the generosity of Messrs. Wernher, Beit, and Co. (who offer 100,000*l.*) and other large business houses, is able to offer to London the means for providing higher technical education. Briefly stated, the idea put forward is to supply London with a technical college after the lines of the world-renowned polytechnic at Charlottenburg, which represents the acme of technical education. It is not for teaching the elements of this or that science; but when the foundation of a thorough education has been laid, students can go there for the building up of the superstructure. It is not an easy matter for a student to gain entrance into the Charlottenburg Institute. A very thorough examination must first be passed, in order to show that he is capable to take advantage of the instruction offered.

The Charlottenburg Institute cost more than 500,000*l.* to build and equip, and entails an annual outlay of 55,000*l.* The offer made by Lord Rosebery to the County Council is one of 300,000*l.* to build the institute, and he has reason to think that the Commissioners of the 1851 Exhibition will grant the site (some four acres of ground). The County Council is asked to contribute 20,000*l.* a year for the maintenance of the institute. This sum may be sufficient at the commencement, but will probably be inadequate as the place becomes known and its value appreciated.

Is it right that the County Council should be asked to find the money? The institute is meant to be imperial. Londoners may and will attend it; but it is hoped by the donors of the funds that students from all parts of the British Empire will flock there, and thus make London, "at any rate, so far as advanced scientific technology is concerned, the