

embodied some very useful practical hints on the care of collections.

Mr. J. A. Charlton Deas introduced the subject of national art loans to municipal museums, pointing out the great and growing need for making the artistic treasures of the nation more accessible to the dwellers in the provinces.

The value of museum guides, catalogues, and other publications was dealt with by Mr. Thomas Sheppard under the title "Pastimes for Curators." He described the manner in which the eighty or more publications issued by the Hull Museum had been prepared, and showed how they kept public interest in the collections alive and frequently led to desirable acquisitions.

Dr. J. A. Clubb read a paper on the purpose and arrangement of an index museum, in which the idea was elaborated of making the entrance hall of the museum a philosophic introduction to those fields of human knowledge covered by the museum collections. The validity of the word "index" in this connection came in for some criticism, but it was generally agreed that some form of introductory collection, broad in conception and treatment, is an absolute necessity in all large museums. By the multiplicity of their collections and specimens such institutions bewilder the uninitiated visitor, who should be enabled to get a clear grasp of what the institution is aiming at by some lucidly sketched outline.

As a new departure in the work of the association, a public lecture was given during the conference. The lecturer was Dr. F. A. Bather, F.R.S., who took for his subject "Open-air Folk Museums." The lecture consisted chiefly of a description of the open-air museum founded at Skansen, Stockholm, by Arthur Hazelius. Dr. Bather gave an outline of the object of such museums, and emphasised the urgent need for promoting some such scheme in Sussex, and thus preserving the fast disappearing relics of its extremely picturesque past.

A further paper by Mr. W. Ruskin Butterfield on folk museums dealt specially with the material at present available in Sussex, and showed how rich Sussex still is in picturesque old dwellings, involving much delightful folklore.

Mr. Arthur Smith showed how collections of photographs might serve the purpose of recording the history and progress of the surrounding district. Many places have collections of photographs and prints secured merely for the purpose of what may be called a survey, but Mr. Smith emphasised the fact that this is not sufficient. Photographs ought to be taken so as to show clearly, for instance, the original and altered condition of a street or building, so that a person looking at them may realise the nature and extent of the change which has taken place.

Evolution in archæology was dealt with by Mr. R. A. Smith, of the British Museum, who described the succession of developmental characters exhibited by such articles of human manufacture as stone implements, pottery, brooches, and primitive British coinage in a lucid and informing manner. He strongly advocated the arrangement of antiquities on evolutionary lines wherever possible.

The evolution of English pottery during the eighteenth century was the subject of a paper by Mr. H. Stuart Page. He argued that the adoption of an intelligent system of classification on lines which he set out in some detail would enable the involved story of English pottery to be illustrated by a carefully selected series of examples showing the gradual development in materials, processes, and technique. It was a matter for speculation how long the English potters would have continued contentedly in their antiquated methods of producing coarse heavy ware but for the introduction of Oriental china, brought into the country by tea-drinking habits. The beauty of this ware—all the more emphasised by the rudeness of the English production—created a remarkable infatuation, and the English potters sought to rival it. Their history then becomes one of laborious costly experiment, absorbing lives and fortunes. Ignorant of chemistry, they were, in fact, groping in the dark. The eventual result, however, was the acquisition of a technical skill which, whatever be the artistic quality, holds its own among the ceramic productions of the world.

Mr. E. Rimbault Dibdin read a paper on the functions and scope of a municipal art museum, in which he showed that there exists in England a very confused idea of the way in which to make an art museum of value. He urged that special efforts should be made to attract curators and directors of art institutions, and to assign a special day to the discussion of the questions of function, scope, conservation, arrangement, lighting, and the hundred and one other practical problems which face the administrator of art collections.

A small trade exhibition organised in connection with the conference was of considerable practical interest to curators.

During the meeting visits were paid to the Worthing Museum and Library, to the Booth Museum, to Hastings Museum, to Sedlescombe Museum, and to Battle Abbey. The association concluded its business by accepting the invitation of the Board of Agriculture and Technical Instruction for Ireland to meet in Dublin in 1912, and by unanimously electing Count Plunkett, director of the Irish National Museum, through whom the invitation was conveyed, to the presidential chair for the ensuing year.

THE FRENCH AEROTECHNICAL INSTITUTE.

ON July 6 the Aërotechnical Institute of the University of Paris, which has been founded by the generosity of M. Henry Deutsch de la Meurthe, was inaugurated at St. Cyr. Its object is entirely scientific, and is to study all problems of aviation and aërostation relative to the support of bodies in the air, both at rest and motion, from the double point of view of theory and practice. Under the presidency of the vice-rector of the Paris University, with M. Deutsch de la Meurthe and the dean of the faculty of sciences of the Paris University as vice-presidents, the council includes all the famous names in French aëronautics, as follows: MM. Armengaud, Barthou, Baumès, Blériot, Bouttieaux, Cailletet, Carpentier, Eiffel, Estienne, Hugon, Janet, Jouguet, Kapferer, Koenigs, Le Cornu, Loreau, Maurain, Marchis, Painlevé, Picard, Sauvage, Soreau, Surcouf, Urbain, Voisin, Weiss.

The area occupied by the buildings and grounds is 72,000 square metres, of which the principal part has been reserved for building purposes. The remainder includes a strip 25 metres by 900 metres, with an additional piece of some 462 metres in length, which has been conceded by the Minister of War. Moreover, 4000 metres have been set apart for the erection of aëroplane sheds, workmen's houses, &c.

In the central hall are the following:—

- (1) A large fan, two metres in diameter, fitted with various adjustments, and an aërodynamical balance for measuring wind-pressures on surfaces.
- (2) A wind tunnel furnished with a fan for the study of the reaction of the air on surfaces, the air-current being capable of maintaining a uniform speed of 20 metres a second.
- (3) An aërodynamical balance.
- (4) A wind tunnel similar to that built by Col. Renard for studying the stability of model hulls or planes.
- (5) An apparatus for measuring the friction of various surfaces moving through air of various pressures at gradually increasing speeds.
- (6) A dynamometrical installation for measuring the thrust of stationary propellers.
- (7) An installation for the study of helicopters.
- (8) A protected chamber for testing the resistance of propellers at very high speeds. (Although it would be difficult to attain to bursting speed, it will be possible to run them at a considerably higher rate of revolution than the normal.)
- (9) A test bench for motors.

In the chemical laboratories researches will be made in the study of light gases, of fabrics for balloon envelopes and aëroplane coverings, and of varnishes.

The physical laboratories will be concerned with the improvement and application of instruments used in aërial navigation, and the physical properties of light gases.

The photographic section will be occupied in obtaining records of experiments made; a special department will test all materials used in the construction of flying-machines and dirigibles; and the usual meteorological instruments are provided.

The power-house contains two compound vertical steam engines, one of 120-150 horse-power, and the other of 30-40 horse-power, driving dynamos of 200-300 amperes and 160 amperes respectively.

In the grounds is an experimental track 1400 metres long, quite straight, and perfectly flat save for 80 metres at one end which has a slope of 10 mm. in the metre to facilitate the start of the rolling platforms, and a rise of 5 mm. in the metre at the other end to assist stopping and returning them.

The rails are 12 metres in length, welded two together by an aluminothermal process so as to give 24 metres without a joint. The current is conveyed to the carriage by live rails raised on oak standards about 0.7 metre high on each side of the track, the return being made through the track-rails themselves.

Four rolling platforms are to be provided, each designed and fitted for its special work. The first measures the vertical and horizontal components of air-pressure on planes and curves, both simple and compound, and determines the position of the centre of pressure at various angles of incidence. This has been already built. The others under construction are to comprise two for propeller testing (one for large dirigible propellers and the other for aeroplane propellers to obtain their thrust, speed of rotation, the power absorbed, and their mechanical efficiency), and one for measuring the resistance of the different parts.

Platform No. 1 weighs, including the motor of 1100 kgs., 4900 kgs. The iron chassis is 6.12 metres long, 2 metres wide, and is rounded in front. The motor-bed is carried in the centre. Two axles 3.60 metres apart carry the chassis, which projects 1.86 metres in front and 0.66 metres in rear. This inequality is for the purpose of putting additional weight on the front axle, which tends to be lifted during experiments with large horizontal surfaces. For the same reason the axis of the motor is nearer the front axle than the back axle. The wheels of cast steel are one metre in diameter. The steering swivels run in ball-bearings, and special arrangements are used to prevent lateral play. A system of brakes engaging additional rails at the end of the track brings the platform to a standstill. All the platforms are to be fitted with the following instruments:—

- (1) A registering chronograph for the number of turns of the axles.
- (2) A registering cinemometer, giving the speed at every point along the course.
- (3) Dynamometers.
- (4) A wattmeter registering the motive power at every point.

The platform at present in use can easily obtain a speed of 33 metres a second.

As open-air experiments are not always desirable or possible, a whirling table has been installed in a circular building 38 metres in diameter. The axis of the planes or propellers tested on the end of the arm will be 16 metres from the centre, thus describing a circle 100 metres in circumference. There are two motors, one of 20 horse-power, which turns the arm, and another of 25-30 horse-power, which is connected up with any propeller undergoing tests.

There only remains to mention the library, on behalf of which an appeal is made for gifts of books, pamphlets, and prints, and the bulletin of the institution, in which will be published from time to time the results of the work accomplished.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

GLASGOW.—At its last meeting for the session, the University Court, with the concurrence of the Senatus, resolved to increase the teaching power of the University by the institution of the following:—a third lectureship in engineering; a second lectureship in zoology, with special reference to protozoology; a new assistantship and a new assistant demonstratorship in physiology; two new assistant demonstratorships in geology; and a new demonstratorship in physical chemistry and radio-activity.

The resignation by Captain Lyons, F.R.S., of his lectureship in geography was accepted with regret. It was

agreed to intimate the vacancy, and to take steps for the appointment of a new lecturer before the beginning of next session.

The resignation by Sir Robert Wright of the office of principal and professor of the West of Scotland Agricultural College brings into operation a provision by which the University and the College, through a joint committee, take part in the appointment of the new professor. The committee will meet for the purpose during the summer.

Professorships of medicine, surgery, obstetrics, and pathology in connection with the Royal Infirmary, and in addition to the existing chairs, have been sanctioned by his Majesty in Council, and will be filled up in time for next session.

THE Nevada State University, says *Science*, has received 50,000l. from Mr. Clarence Mackay, of New York City, and several of his friends, for the construction of a library and administration building.

THE annual meeting of the Midland Agricultural and Dairy College, Kingston, Derby, will be held at the college on Monday, July 31, when the report on the year's work will be presented, and the Duke of Devonshire will address the meeting and present the diplomas and certificates awarded to students during the past session.

It is stated in *Science* that all the qualified men in this year's graduating class in the College of Agriculture of the University of Wisconsin have secured positions, and the requests for teachers are still coming in. The demand is especially strong from agricultural high schools both in Wisconsin and other States. Many of the requests are for men who have been brought up on farms, have had some teaching experience, and also have had a thorough course in agriculture. The demand for such instructors in agriculture for high schools is very much greater than the supply. Even as early as four weeks ago most of the seniors had accepted positions as farm managers, as research assistants, or as teachers of agriculture in colleges and secondary schools. The average salary of the men who will teach next year in agricultural schools is 250l.

IN referring, in the issue of *NATURE* for March 2 (vol. lxxxvi., p. 30), to the centenary of the University of Christiania, which was founded by King Frederic IV. in 1811, we were able to give the important items of the interesting programme of events which has been arranged for the occasion. The following representatives of British universities and other institutions had, up to July 13, been chosen to attend the celebration, which begins on September 4 and lasts until September 8:—University of Bristol, Prof. I. Walker Hall; University of Cambridge and the Cambridge Philosophical Society, Sir George Darwin, K.C.B., F.R.S.; University of Durham, Rev. H. Gee; University of London, Dr. H. A. Miers, F.R.S.; the Royal Society, Sir J. Rose Bradford, Sec.R.S.; the British Academy, Prof. W. Paton Ker; the Royal Institution, Prof. H. E. Armstrong, F.R.S.; the Victoria Institute, Dr. J. W. Thirlte; Victoria University of Manchester, Prof. C. H. Herford and Sir William J. Sinclair; University of Oxford, Prof. W. J. Sollas, F.R.S.; University of Aberdeen, Prof. D. W. Finlay; University of St. Andrews, Dr. H. M. Kyle; University of Edinburgh, Lord Edward T. Salvesen, K.C.; the Royal Society of Edinburgh, Mr. James Currie; University of Glasgow, Prof. J. Ferguson; Queen's University of Belfast, Prof. J. Symington, F.R.S.; University of Dublin, Rev. T. B. Willson; the Royal Irish Academy, Prof. C. Marstrand.

LORD HALDANE distributed the prizes at Mill Hill School on July 22 and delivered an address. He said the British nation is now taking a wider view of education. A great deal has been learnt from the Continent and from hard experience. "For two years and a half," said Lord Haldane, "I have been chairman of a Royal Commission on University Education. How much longer we shall have to sit before we have dealt with the whole of the material we have to survey I do not know." The Commission has shown two things—first, that the nation is waking up about education, and that very great advances are being made; and, secondly, that those advances have come none too soon, because other nations have been making advances. This nation has come to learn that education is one and