

carried in the lower layers of ice. It was also a matter of frequent observation that *débris* lies under the ice. Apparently the ice sometimes pushes this along, and sometimes slides over it. At the end of the glacier the *débris* within the ice is freed by melting, and accumulates as a talus-slope. This sometimes protects the basal layers from melting, and they become at length incorporated in the growing accumulation.

It appeared, from the stages presented by the several glaciers, that where the ice is slowly advancing, the talus-slope gradually grows forward and constitutes an embankment, upon which the glacier advances. It thereby grades up its own pathway in advance. On seeing this process, one is at no loss to understand how ice can advance over fields of sand or soil without in any way disrupting them. It buries them before it advances upon them.

Where the frontal material accumulates in a large mass, it opposes such a degree of resistance to the ice that its layers are curved upward on the inner slope; and if the glacier subsequently advances, the ice rides up over the moraine. Several such instances were observed, but none was seen where the ice showed any competency to push even its own *débris*, in notable quantity, in front of it. The ice is weaker than the moraine as a whole.

Great quantities of snow are carried by winds from the region of the great ice-cap, and this snow may be lodged in immense heaps in the lee of the terminal moraines. Such a border-drift may have a breadth of from 1000 to 3000 feet. It becomes solidified after the fashion of a glacier, and may serve to arrest or deflect the main ice; for it was observed that the basal layers of the ice in places curved upwards on encountering the resistance of this wind-drifted accumulation.

The rate of movement of the majority of the glaciers was found to be exceedingly slow, though a few which produce large icebergs are notable exceptions.

The amount of drift on the territory once occupied, but now free from ice, was scanty. At some points there are considerable accumulations of drift within a mile or two of the present ice-front, but over much of the area no great moraines, nor any thick mantles of drift, were to be seen. There was but moderate evidence of glacial action; the land was gently rounded, but not greatly moulded. In this area of Southern Greenland tracts of angular, unsubdued topography alternate with rounded, flowing contours. The inference was drawn that the ice formerly so extended itself as to reach the present coast for about half its extent, while in the remaining portion the ice fell short. Thus the conclusion seems unavoidable that the ice of Greenland, on its western side, at least, has never advanced very greatly beyond its present border in recent geologic times. This carries with it the dismissal of the hypothesis that the glaciation of the mainland of North America had its source in Greenland.

There is no ground to question the former elevation of Greenland, but it would appear that this was not coincident with conditions favouring glaciation.

H. B. W.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—Among the distinguished men upon whom it is proposed to confer the honorary degree of D.C.L., on June 26, are Sir W. H. Flower and Prof. Michael Foster.

IN a Convocation held on Tuesday, the statute appointing Dr. E. B. Tylor professor of Anthropology during the tenure of his office as Reader in Anthropology was finally approved. In a Congregation, held on the same date, the Statute on Research Degrees received the final approval of the house, and it only remains for it to be passed by Convocation. The proposed Final Honour School of Anthropology was again brought before Congregation, and excited some opposition. On a division the proposed statute was carried by a considerable majority, the numbers being: Placet, 47; Non-placet, 28. The statute has yet to run the gauntlet of Convocation before it finally passes into law. In the same Congregation, the dates of the preliminary examinations in the Honour Schools of Natural Science were fixed for the Monday after the eighth week of Full Term in Hilary Term in each year, instead of in the last week or last week but one, as has hitherto been the custom; and the grant of £300 per annum to the chemical department of the University Museum was renewed for a period of five years. The published lists of the candidates for the final and preliminary

examinations in Natural Science show that there are 44 candidates in the final school and 64 candidates in the preliminary school. These figures do not include women students.

CAMBRIDGE.—The following is the speech delivered by the Public Orator, Dr. Sandys, on May 30, in presenting for the honorary degree of Doctor in Science, Dr. John Murray, editor of the *Challenger* publications.

Meministi omnes poetæ nostri maximi locum insignem, ubi Northumbriæ Ducis filius acerrimus non recusavit gloriam aut ex ipsa luna audacter deducere, aut maris in profundo demersam extrahere, modo solus sine rivali laudem omnem sibi vindicaret. Quanto pulchrius autem rerum naturæ penetralia intima assidue perscrutari, eque oceani altitudine immensa laudem cum sociis optimis participatam reportare. Adest unus ex illis qui, plusquam tribus annis in oceano explorando fortiter toleratis, ut poetæ antiqui verbis sensu novo utar,

“referebant navibus altis
occulta spolia, et plures de pace triumphos.”

Una saltem nominis bene ominati navis velut ipsam rerum naturam ad certamen provocavit, ipsamque veritatem in profundo abstrusam orbi terrarum patefecit. Tanti autem itineris monumenta, quinquaginta voluminum in serie ingenti a collegis plurimis parata, viri huiusce præsertim industria infinita non modo adaucta et summam descripsit sed etiam ad terminum felicem perducta et dièi in lucem prolata sunt. Quid non potuit rerum naturæ, quid non potuit veritatis amor?

“Mersis profundo; pulchrior evenit.”

Duco ad vos Universitatis Edinensis alumnus, oceani indagatorem indefessum, virum etiam in posterum sine dubio laudem indies maiorem meriturum, IOANNEM MURRAY.

The Master of Downing (Dr. Hill) and Dr. Barclay-Smith will give a course of instruction in Practical Histology during the Long Vacation, beginning on July 6.

The State Medicine Syndicate propose to make a grant of £50 to the Department of Pathology, in aid of the course of laboratory instruction in Bacteriology therein provided for candidates for the diploma in Public Health.

Prof. Ewing's serious illness has made it necessary to appoint Mr. Dalby, Demonstrator in the Engineering Laboratory, to act as Examiner for him in the Mechanical Sciences Tripos.

The Smith's Prizes in Natural Philosophy have been awarded (1) to G. T. Manley, of Christ's College, for his essay on “The Conformal Representation of a Quadrilateral on a Half Plane,” and (2) to G. H. J. Hurst, of King's College, for his essay on “Electro-magnetism and Magneto-optic Rotation.” Mr. Manley and Mr. Hurst were respectively Senior and Second Wrangler in 1893. The essays of H. E. Atkins, of Peterhouse, and P. E. Bateman, of Jesus College, are declared worthy of honourable mention. Mr. Atkins was bracketed Tenth Wrangler, and Mr. Bateman bracketed Fifteenth Wrangler in the same Tripos.

Mr. S. S. Hough, of St. John's College, has been elected Isaac Newton Student in Astronomy for the three years ending June 15, 1898.

Mr. Charles Chree, Director of the Kew Observatory, has been approved for the degree of Doctor of Science.

Mr. W. N. Shaw has been appointed Chairman of the Examiners for the Mechanical Sciences Tripos, in the room of Prof. Ewing, who has resigned on the ground of illness.

Mr. Charles Smith, Master of Sidney Sussex College, has been elected Vice-Chancellor for the ensuing academical year.

Classes in Osteology, in General Chemistry, in Geology, and in Experimental Physics, are announced to be held in the Long Vacation.

Mr. A. E. Shipley, University Lecturer in Invertebrate Morphology, has been appointed a member of the University Press Syndicate.

PROF. W. T. A. EMTAGE, of University College, Nottingham, has been elected Principal of the Technical Institute, Wandsworth.

HONORARY degrees were conferred, by the Chancellor of Victoria University, last week, upon Lord Kelvin and Sir Henry Roscoe, among others, for distinguished services rendered to the University.

THE twelfth annual report of the Mitchell Library, Glasgow, is before us. The library is open to the public, and is adminis-

tered by a committee of the Glasgow Town Council, from which it obtains a grant of £2000 a year, from the moneys received under the Local Taxation (Customs and Excise) Act; it is also fortunate in being the recipient of several bequests from persons interested in its work. A noteworthy point is that, out of a total of 112,447 volumes contained in the library, no less than 20,812 are classified under "Arts, Sciences, Natural History." This is two thousand volumes more than are included under any other head. The most important accession to the library during the three years covered by the report (1892-94) consists of a complete set of the *Transactions of the Royal Society*, in 183 volumes. A very valuable addition to the scientific resources of the library has resulted from agreements entered into with the Glasgow Natural History Society, and with the Glasgow Geological Society. These societies have transferred to the library their sets of the *Transactions and Memoirs of foreign scientific societies*, the Library Committee undertaking on their part to continue to the members their privilege of borrowing the books, to bind such as required it, and to bear the expenses attending the printing extra copies of the *Transactions of the Glasgow societies*, and forwarding the same to the foreign societies as an exchange. During last year, 115,788 scientific works were issued, the daily average being 386. It would be well if there were more public libraries conducted on the enlightened plan of the Mitchell Library.

ANOTHER library of which we have received the report in this case the first report) is that of St. George, Hanover Square. Though on a much smaller scale than the Mitchell Library, the Commissioners appear to aim at making the library a means of education as well as of recreation. There are 11,860 volumes in the lending library, of which twenty per cent. are fiction, and 6206 in the reference library, none of which are novels. To obtain a satisfactory conclusion as to the work of a library, the use made of the library as a whole, and not of any particular department, ought to be taken into account. The records of the institution show that out of 416,760 visitors during the year, only thirteen per cent. of the readers went for the purpose of borrowing works of fiction from the lending library. A noteworthy feature in connection with the library is a museum of objects arranged as an elementary and self-explanatory collection, as an introduction to larger museums of natural history.

It is proposed to hold a Technical Education Conference at the Society of Arts on June 20. The Society has addressed a letter to Technical Education Committees, asking them to send delegates to the Conference. Among the subjects to be considered is the "lack of a central organisation which might deal especially with such questions as the examination and inspection of classes. In spite of the valuable work which has been done by the City and Guilds of London Institute, and by other bodies, it is only in a portion of the subjects sanctioned as subjects of technical instruction that examinations are held. The wide field of agriculture and home industries is untouched; while no means are provided for anything like a general system of inspection which local authorities may call to their aid should they desire to do so." There are also other points with regard to which common action would be desirable, and it is hoped that by bringing together those who are interested in technical education the best way in which the Society can enlarge the scope of its present action in connection with the subject will be found.

THE Technical Instruction Committee of the Essex County Council have arranged for a short course of elementary instruction in horticulture, to be given at the County Technical Laboratories, Chelmsford, during the first three weeks in July. The course of study is intended to give sound elementary instruction in the cultivation of plants, based upon a knowledge of plant physiology. The teaching throughout will be practical; every lecture will be abundantly illustrated and immediately followed by demonstrations and individual practical work by the students themselves.

SCIENTIFIC SERIALS.

Internationales Archiv für Ethnographie, Band viii. Heft ii.—On the ethnography of Matty Island, by Dr. F. von Luschan. Although Matty is a small island, about ninety-three miles north of German New Guinea, between 142° and 143° E. long., Dr.

von Luschan comes to the conclusion that the natives are not Melanesians; they are much lighter than almost any Melanesians, some being of a deep red flesh colour, eyes slit-like, nose narrow, hair black and in long locks. Of the thirty-eight weapons and utensils in the Berlin Museum not one can with certainty be allocated to any known culture-mixture; any Micronesian resemblance is purely superficial. It seems probable that the people have remained isolated for at least 300 years. Three plates of utensils, &c., illustrate the paper.—Dr. O. Schellong's note on some Melanesian drawings is illustrated by two coloured plates, and is supplemented by some notes by J. D. E. Schmeltz. The drawings are interesting as showing how unlike the objects intended native delineations may be. It is to be hoped that more illustrations of this aspect of the art of savages will be forthcoming. Of the notices of recent publications, those on "Arrow-poison" and "Ethnological Botany" are especially interesting.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, May 2.—"Alternate Current Dynamo Electric Machines." By J. Hopkinson, F.R.S., and E. Wilson.

The paper deals experimentally with the currents induced in the coils and in the cores of the magnets of alternate current machines by the varying currents in and the varying positions of the armature. It is shown that such currents exist, and that they have the effect of diminishing to a certain extent the electromotive force of the machine when working on resistances as a generator without a corresponding effect upon the phase of the armature current. It is also shown that preventing variations in the coils of the electromagnet does not, in the machine experimented upon, greatly affect the result, and that the effect of introducing copper plates between the magnets and the armature has not a very great effect upon the electromotive force of the armature, the conclusion being that the conductivity of the iron cores is sufficient to produce the main part of the effect. A method of determining the efficiency of alternate current machines is illustrated, and the results of the experiments for this determination are utilised to show that in certain cases of relation of phase of current to phase of electromotive force, the effect of the local currents in the iron cores is to increase, instead of to diminish, the electromotive force of the machine.

May 9.—Bakerian Lecture: "On the Laws of Connexion between the Conditions of Chemical Change and its Amount." By A. Vernon Harcourt, F.R.S., and William Esson, F.R.S. "III. Further Researches on the Reaction of Hydrogen and Dioxide and Hydrogen Iodide."

In this paper are considered the effect upon the reaction of (1) substances not directly participating in reaction, (2) temperature.

The general conclusion as to the effect of the medium upon the reaction is expressed as follows:—

Each constituent of the medium produces an effect on the rate of change of unit peroxide and unit iodide, proportioned to the mass, and varying with the nature of the constituent. The increment of this rate per unit mass of each constituent is constant so long as the quantity of the predominant constituent present in the medium is sufficiently large, in comparison with the other constituents of the medium, to render the media in successive experiments practically homogeneous. For example, when the ratio of the numbers of H^2SO^4 and HI in the medium exceeds 20, the formula for the rate at a given temperature is

$$a = i \{ a + b(i - 1) + ds \},$$

a being the theoretical rate with unit of HI , b the increment per unit of hydrogen iodide per unit of iodide, and d the increment per unit of hydrogen sulphate per unit of iodide. If the ratio falls below 20 the formula is

$$a = i \{ a + b'(i - 1) + d's \},$$

in which b' and d' depend upon the relative masses of sulphate and iodide present in the medium.

Variation of Temperature.

The discussion of the numerous experiments made at temperatures ranging from 0° to 50°, in media in which the quan-