peninsula going eastward to 12° W. long., so that the outlet between Greenland and Spitsbergen of the great Polar basin thus becomes rather narrow. In this connection I shall just mention that Dr. Nansen, on account of his hydrographical observations in the Polar sea, supposed the existence of a suboceanic ridge between Greenland and Spitsbergen, and as the coast of Greenland here is quite flat, the probability is that such a ridge really exists.

The frontier of the inland ice is in some places quite steep, in other places you might have mounted the inland ice without knowing it. The glaciers are few and not very productive; still, the fjords are sometimes quite filled up with icebergs stranded on barriers in the mouths of the fjords.

In the interior, about forty miles from the edge of the inland ice, we found and mapped out some islands, nunalands, quite surrounded by the inland ice. Strange though it may sound, we here saw flowers and tracks of foxes; also in some places coal. During the winter the land was covered with snow, with only here and there some bare wind-swept spots. In the spring this snow partly evaporated, even with a temperature of 20° F. Then the water began to melt in the ravines, and, running under the glaciers, it formed the most fantastic ice-grottoes, where the light was broken into all colours through the crystal-like icicles.

The change into summer was quite sudden. Gradually the temperature of the snow had risen to zero, and then in one day it all melted. The rivers were rushing along, flowers were budding forth, and in the air the butterflies were fluttering. It was a lovely time, bringing hard work for the botanist Lundager and the zoologists Manniche and Johansen. The birds came nearly all on the same day, most of them even at the same hour. One day we had only had the ordinary ptarmigan and the raven; the next we had the sanderling, the ring-plover, the goose, the eider duck, and many others. Young sanderlings, icelandic ring-plovers, and Sabine gulls were found by Mr. Manniche, our indefatigable ornithologist, and fine specimens were brought home.

Of larger animals we found bears, musk-oxen, and wolves; foxes on land, and walruses and seals at sea. Bears are rather plentiful; we shot ninety in all, but musk-oxen and wolves are scarce. The five wolves we got were, I believe, all that were there. They were very meagre, and looked as if they had had nothing to eat for a long time. The snow-hares, which we found in great numbers, were very tame in April and May, and we could then go quite close to them. In the sea, the lakes, and the rivers animal life was not abundant. Some polar cod and inferior animals were usually the results of our net-fishing. In one of the lakes, however, salmon were plentiful.

Especially in the autumn we had the most beautiful Fata Morgana, with castles and ships high up in the clear air, while also the outlines of the coast were quite changed. The explanation of this is the great difference in temperature between the air and that of the new ice, which has still the temperature of the water. Our meteorologist, Mr. Wegener, studied these phenomena with great skill, and, moreover, took magnetic and electrical observations.

In the beginning of November the sun left us for good, the red colours of the southern sky grew fainter and fainter, while from the north darkness spread all along the sky. The temperature went down; in February and March it was as low as −58° F., but at times it would again rise to 32° and even to 34°. Mr. Wegener sent up his kites and balloons throughout the whole winter, and the instruments often registered a much higher temperature in the upper strata of the air.

As a rule, the weather was calm and clear, but when the barometer sank the temperature rose, and the sky became overcast; we all sought shelter, for then we knew that a storm was coming, drifting the snow high above the masthead, and generally lasting for two or three days.

We spent two years in Greenland, and in these two years the weather was quite different. (The winter of 1906–7 was cold and calm, that of 1907–8 milder and more windy. The ice in the first winter grew 6 feet thick and broke up very late, in the second it was only 4 feet thick.) In the middle of February the sun came back, and May and June were a period of fogs and faint sea breezes. Otherwise, the wind was constantly from the north-west, coming from the high pressure of air which is found over the inland ice.

We found no living Eskimo, but everywhere along the coast up to the Danmark Fjord we found their tent stones, their meat caches, and in some places even winter dwellings. From kayaks and umyaks they have hunted the same animals which we found there, and besides whales and reindeer, which we did not find. Our ethnologist, Thostrup, made a very interesting collection of their various tools, &c.

Outside the coast the pack-ice was moving southward with the polar current, and we have mapped out the border of this pack-ice, which showed that the current is everywhere following the line of the outer islands and rocks, while in the waters inside this line pack-ice is rarely found. It was rather an interesting fact that we found great lanes in the ice from 80° to 82° N. lat. At the Malemuk mountain we found open water every time, in April, June, and November, the cause of which may be the current. The water in the fjords was mixed polar and gulf water, the gulf water probably running in along the supposed Greenland-Spitsbergen ridge and going southward with the polar current.

By making holes in the ice investigations were carried on even at a temperature of −2° F. In a big fresh-water lake salt water was found, giving an odour of sulphide of hydrogen at the bottom. The lake must formerly have been a fjord, but the land rose so that the fiord became a lake. The geological conditions, as well as the fact that we found the carcase of a big whale at the border of this lake, seem to strengthen this theory. The tides were not very strong; the ordinary difference between high and low water was 5 feet.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The council of the Senate reports that it has had under consideration the position of the study of astrophysics in the University in connection with the offer of the Royal Society to give to the University the equipment of Sir William Huggins's observatory. It is of opinion that the time is opportune for giving further recognition in Cambridge to astrophysics. With the approval of the general board of studies, the council recommends to the Senate the establishment of a professorship of astrophysics, without stipend and limited to the tenure of office of the first professor.

Mr. H. O. Jones, of Clare College, has been approved as deputy for Sir James Dewar, the Jacksonian professor of experimental philosophy, during the Lent term of 1909.

An examination for minor scholarships in natural science and mathematics will be held in Downing College on Tuesday, March 2, and subsequent days. The examination in natural science will consist of paper work and practical work in (1) chemistry, (2) physics, (3) biology, (4) comparative anatomy, (5) botany. No candidate will be examined in more than three of the above subjects, and great weight will be given to proficiency in some one subject.

The qualifying examination for the mechanical sciences tripos is now held in June and at the end of November. The majority of the students take the examination in June, and experience has shown that the November examination is not much used. It is proposed to substitute for this latter an examination in November at which the best students—those who desire to take the tripos in two years—may pass the examination immediately on coming into residence.

MR. W. MORGAN has been appointed professor of motor-car engineering at the Merchant Venturers' Technical College, Bristol.

IT is announced in *Science* that Mr. G. M. Laughlin, of Pittsburg, has bequeathed 20,000l. to Washington and Jefferson College.

PROF. A. L. LOWELL, professor of political science in Harvard University, has been selected to succeed Dr. Eliot as president of the University. Prof. Lowell was born in Boston in 1856, and represents a family which has been prominent in Massachusetts affairs for a century.

A REUTER message from Berlin states that a professorship of aëronautics has been instituted at Göttingen University. The Minister of Education has appointed Prof. Prandtl, professor of applied mechanics at Göttingen, to lecture on the whole field of aëronautics.

CAPTAIN H. G. LYONS, F.R.S., Director-General of the Survey of Egypt, has been appointed lecturer in geography at the University of Glasgow from the beginning of the next academic year. Captain Lyons, who was vice-president of the geographical section of the British Association last year, has also been appointed by the West of Scotland Provincial Committee to be lecturer in geography to teachers in training.

As an instance of practical science at universities, the New York correspondent of the *Times* states that the Columbia Wireless Club, composed of students of the scientific department, will soon be prepared to inaugurate inter-collegiate wireless telegraphy with the students of Princeton University, New Jersey, and with the University of Pennsylvania. The novel experiments will be watched with interest as a method of teaching practical developments of science.

THE Board of Education has issued as a Blue-book (Cd. 4440) the reports from those universities and university colleges in Great Britain which participated in the Parliamentary grant for university colleges in the year 1906–7. The present volume is the first of a series in which all the reports in any one volume relate to the same academical year. It is much to be regretted that the Board of Education makes no attempt to collate the particulars provided concerning the seventeen institutions participating in the annual grant, which now amounts to 100,000*l*. It is at present a long and tedious process to compare, say, the income, the endowments, number of staff, and students of one institution with those of another. The arrangement of the volume, in fact, compares very unfavourably with the similar report of the U.S. Commissioner of Education published at Washington. The Board of Education may earn very easily the gratitude of students of the progress of higher education in this and other countries by including in the report of next year a series of tables summarising and comparing the educational condition of things in the universities and university colleges here concerned. It would then prove possible to understand more precisely why certain institutions are selected to receive a Treasury grant while others are precluded. For instance, we have before us the report for the session ending in August last of the East London College, which the Senate of the University of London recognises as a school of the University. The Treasury appears to be the only body which as yet has not accorded full recognition to the East London College of its status as the University College for East London. During the session 1905–6 the governors made a formal application for the college to participate in the Treasury grant. The inspectors appointed by the advisory committee of the Treasury visited the college and a favourable report was published. Yet no grant was awarded. If the tables suggested were available, it might be easier by careful comparison to understand this and other decisions. At present it is possible only to puzzle over the question. The number of students of university standing, the number of university successes, and the output of research work at the East London College seem to compare favourably with those of several of the university colleges receiving grants.

THE annual meeting of the Mathematical Association was held at King's College, London, on January 12. The association now consists of 496 members, representing an increase of more than 20 per cent. on the preceding year. The year which has just ended has been characterised by unusual activity. The formation of local branches has for many years been considered desirable, and a first move in this direction has been made by the formal recognition of a North Wales branch under the local secretaryship of Mr. T. G. Creak, of Llanberis. The association has appointed representatives on a joint committee with the Public Schools Science Masters' Association to consider the best means of coordinating teaching in mathematics and science. Dr. Bovey, F.R.S., read a paper on the mathematical training of technical students, in the course of which the necessity was pointed out of teaching such students to realise the value and utility of the theoretical training which they were receiving. Dr. Bovey considered the influence of the teacher, the text-book, the mental powers of the student, and carefully planned courses. The question further arose as to whether the teaching of technical students should be in the hands of mathematicians or engineers. While favouring the latter choice, Dr. Bovey quoted the opinion expressed by Prof. Slichter, who considered that the most competent teacher should be an engineering graduate, but that it would be necessary for him to have at least three years of post-graduate study in advanced mathematics. It was, however, impossible to induce graduates of technical schools to give this amount of time to preparation for instructional work when other fields of work offered such far better and more immediate prospects. Dr. Bovey thinks that in these circumstances the best plan at present is to secure an excellent mathematician, and to induce him to fit himself for the post by making himself in some degree familiar and sympathetic with the engineer's point of view and with the class of problems with which his students will have to deal in after life. Papers were subsequently read by Prof. Alfred Lodge on homography and cross-ratio, and by Prof. Bryan on the need of a new symbol, in approximate calculations, to denote digits the values of which are unknown, and which at present are represented by zeros. In his retiring address the latter directed attention to the serious danger of the extinction of the English mathematical specialist, and the necessity of fighting against this tendency. Engineers and others had plenty of problems for which all the resources of the mathematician were needed, but the latter found that this work interfered with his means of earning a livelihood. In defending the specialist against the attacks of the outside public—attacks essentially peculiar to Great Britain—Prof. Bryan pointed out that men who had specialised in part ii. of the mathematical tripos were prominently to the front on all committees appointed by the association for reforming mathematical teaching on common-sense, practical lines.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, Received August 10, 1908.—"Reciprocal Innervation of Antagonistic Muscles. Twelfth Note. Proprioceptive Reflexes." By Prof. C. S. **Sherrington**, F.R.S.

Whereas most reflexes are excited by environmental changes acting directly as agents on the receptive organs, by proprioceptive reflexes are meant reflexes excited habitually by the organism acting as agent upon itself, and thereby applying its own organs or parts as stimuli to its own nerves. In propioceptive reflexes the organism applies itself as a stimulus to itself. By its own act and in its own substance it excites one or more of its own receptor organs. In the bending of the knee, the organism, by executing the movement of a part of itself, supplies by that means an alteration of the condition of that part, and so stimulates certain reflex arcs, propioceptive arcs, arising in that part. The reaction thus excited is causally less directly related to the environment than are reflexes excited directly by the surrounding world. In other words, an important difference between propioceptive and other reflex reactions is that the former stand only in secondary relation to the external world, whereas the latter stand always in primary relation to it. One outcome of this is, as has been previously[1] pointed out, that the proprioceptive reflexes tend to ally themselves to, fuse with, and habitually reinforce other reflexes of exteroceptive and interoceptive origin.

It is shown in the present paper that the bending of

[1] Sherrington, "Integrative Action of the Nervous System. (London and New York, 1906.)