NOTES.

A MEETING to further the interests of the forthcoming expedition, under Captain Scott, to the South Polar regions, was held at the Mansion House on Tuesday last, the Lord Mayor presiding. Captain Scott laid the plans and objects of the expedition before the meeting, and stated that 40,000*l.* was required for the estimated cost of the first year's work. He further said that if that sum was contributed by this country he hoped that, with the cooperation of the over-seas dominions, they might raise a sum sufficient to carry on the work until it was finished, that was to say, if necessary, for a second and possibly a third season. He would prefer a request for support to the Government of the Commonwealth of Australia, because the scientific work of an expedition of that kind —its meteorological and magnetic observations—was possibly of greater use to the countries which lay adjacent to the region of research than it was to the homeland. A resolution in support of the expedition was passed.

ACCORDING to a Reuter telegram from Washington, the National Geographic Society has passed a resolution requesting Dr. Ira Remsen, president of the U.S. National Academy of Sciences, to appoint a commission to examine the records and observations of Dr. Cook and Commander Peary. This action is based on a proposal made by the Peary Arctic Club.

AT a meeting of the executive committee of the Zeppelin Polar Expedition, held at Friedrichshaven last week, it was decided that a preliminary expedition should be sent next summer to Spitsbergen in order to investigate the polar ice and determine the conditions affecting the management of airships in those regions. The committee laid great stress upon the importance of promoting the development of Zeppelin airships for long journeys, especially over the sea, for the purpose of scientific investigation. Plans are to be drawn up immediately for the construction of a suitable airship, which is to be ready at the beginning of 1911.

IT is stated by a *Times* correspondent that Mr. Evelyn Baldwin, the leader of the Baldwin-Ziegler expedition of 1901–2, announces his intention to make an attempt to reach the North Pole by drifting with the ice eastward on a parallel course to that taken by the *Fram*. He calculates that the voyage will last four years.

LIEUT. SHACKLETON delivered a lecture before the Danish Geographical Society on Saturday last on the work of his late expedition, and received from the president the gold medal of the society. He also had conferred upon him, by the King, the Commandership of the Dannebrog Order of the Second Class. It is the intention of the explorer to present a small collection of specimens of Antarctic rocks to each of the principal geological museums.

A SEVERE shock of earthquake was experienced in the island of Shetland at about two o'clock on Saturday morning last. The shock was accompanied by a dull rumbling sound, which many fishermen mistook for the sudden outbreak of a hurricane.

ACCORDING to a Reuter message, a severe earthquake shock was experienced at Reggio di Calabria in the morning of October 7.

A STORM of unusual violence broke over Havana and the coast of Florida on Monday last. The damage to property at Key West is estimated at 400,000*l.* At Havana five persons were killed and many injured.

WE note with regret the death, on Saturday last, of Dr. Hugh Blackburn, emeritus professor of mathematics at the University of Glasgow. Prof. Blackburn was born on July 2, 1823, and filled the chair of mathematics in the University from 1849 until 1879, when he was succeeded by Prof. Jack.

MR. RICHARD BANNISTER, whose death occurred at his residence in South Kensington on September 27, had held the position of deputy principal chemist in the Government laboratory for about twenty-five years. He attended the Royal College of Chemistry in 1862–3, obtaining full marks at the final examination of the students, and was attached to the small chemical staff then at Somerset House. Eleven years later he was promoted to the post of deputy principal, and continued to hold this office until his retirement from the public service in 1898. On such analytical matters as the detection of adulterations in tobacco or of methyl alcohol in spirituous liquors, Mr. Bannister in the earlier stages of his career was often required to give expert testimony. Later, however, in accordance with what his duties demanded, it was chiefly as an administrator and a shrewd man of business that his capabilities were shown. He gave evidence before several Royal Commissions, notably upon the questions of the materials used in brewing beer and the adulteration of food products. His knowledge, judgment, and sound common sense were also recognised outside strictly official circles. He was a Cantor lecturer on certain food-stuffs, such as tea and coffee, the lectures containing much useful technical information of a kind not easily found at that time in text-books. He acted as juror at the Paris and Chicago exhibitions, where his combined chemical and business experience—for he was a director of the Civil Service Stores, as well as an analytical chemist—was no doubt of exceptional value. Mr. Bannister, who was in his seventy-fifth year, was a member of the council of the Institute of Chemistry.

MR. JAMES BRITTEN has just retired from the botanical department of the British Museum after a period of service of thirty-eight years. Previously to joining the staff of the British Museum he was for two years an assistant in the Kew Herbarium, and has therefore completed forty years in the service of the State. Mr. Britten has recently been engaged in the preparation of a catalogue of the Sloane Herbarium, which will shortly be published by the trustees. The collections of Sir Hans Sloane, it will be remembered, were the foundation of the British Museum, and his herbarium contains some of the earliest botanical collections from many parts of the world, and is of great importance in connection with the systematic works of Linnæus and other botanists of the eighteenth and early nineteenth centuries.

ACCORDING to a *Times* correspondent, a further fossil human skeleton has just been discovered in the department of the Dordogne at Ferrassie, 5 kilometres from Bugue, in a layer belonging to the lower middle post-Tertiary period.

A CORRESPONDENT of the *Globe* states that the remains of a lake-dwelling (reputed to be 4000 years old) have just been discovered by Dr. Otto Froodis while excavating the hilly region near Lake Vettern, in Sweden. Weapons and primitive household utensils were found in stone, flint, bone, and horn.

THE demonstrations in connection with the museum of the Royal College of Surgeons of England, which were inaugurated last year, are to be continued by Profs. A.

Keith and S. G. Shattock. This year's course is to begin to-morrow. It will be open to all practitioners and medical students on presentation of their cards.

THE first monthly general meeting of the new session of the Institution of Mechanical Engineers will be held to-morrow, when a paper will be read by Prof. W. E. Dalby entitled "Heat Transmission." It will be remembered that in 1906 the members of the institution decided, by vote, that the subject of heat transmission was suitable for further research, and Prof. Dalby has therefore, at the request of the council, collated in an appendix to his paper information already published relating to the transfer of heat across metallic surfaces in contact with water and with gases.

THE syllabus of the first half of the 137th session of the Medical Society of London has reached us, from which we learn that on October 25 a paper is to be read by Dr. F. W. Hewitt on the need for legislation in regard to anæsthetics, and the lines upon which it should take place. Subsequent papers will be read by Prof. Arthur Keith and Dr. James MacKenzie. The Lettsomian lectures will be delivered on February 7 and 21 and March 7 by Dr. J. S. Risien Russell, on the cerebellum and its affections.

ACCORDING to the *Lancet*, a new edition of the catalogue of the pathological section of the Museum of the Royal College of Surgeons of England is to be prepared by Prof. S. G. Shattock, with the assistance of Mr. Alban Doran; a new edition of the catalogue of the Entozoa, by Dr. R. T. Leiper, is also in preparation.

NOTICE is given of the holding, in June and July, 1910, of an International Agricultural Exhibition at Buenos Aires. Communications respecting the exhibition should be addressed to the secretary, 316 Florida, Buenos Aires.

THE inaugural meeting of the China Philosophical Society was held at Tientsin on September 18, under the presidency of the president of the Pei Yang University (Mr. Wang Shoh Lian), who, in the course of his address, pointed out the importance of the existence of such a society in the present stage of China's development, when western learning is being spread over the Empire. The possibilities before the society are unlimited, as all branches of science and art present practically untouched ground, and it can do much to build up the new learning, to foster and organise research, to unite Chinese and foreign students in a common cause, and help these to understand each other better; to assist in the introduction of foreign methods and in the adaptation of these, and yet to protect and retain those older methods which are threatened with extinction. After the delivery of the address referred to, papers were read by Dr. G. Purves Smith, on agricultural possibilities of North China, and Dr. Wu Lien Teh, on a striking example of scientific farming in Chihli.

WE learn from the *Times* of October 11 that the shipments of salmon ova to New Zealand in the early part of this year have, so far, proved highly successful. Of the first consignment of some half-million eggs from Scotland and Ireland, only about 5·6 per cent. died on the voyage out. The second consignment consisted partly of English and partly of German eggs; the latter had to be re-packed in London, and about 7·8 per cent. of them perished on the voyage to New Zealand, while of the former only about 1·7 per cent. failed to reach their destination in safety. On their arrival in New Zealand the eggs were immediately sent to the hatcheries, where they commenced hatching out within a few hours of their arrival. There is clearly no difficulty about transporting salmon eggs to New Zealand in good condition. The difficulty is to rear the young fish after hatching. Hitherto all attempts to do this have failed in New Zealand, and we shall be much interested to hear what happens in the present instance. If they can once get established, there seems no reason why the salmon should not thrive in New Zealand as well as the trout, the acclimatisation of which has long since been successfully accomplished.

THE exploration of the fauna and flora of the waters of Lake Tanganyika has been carried out with important results during the last ten years owing to the efforts of Sir Ray Lankester. He obtained funds from the Government grant committee of the Royal Society, in the first instance, in 1895, which were employed in sending Mr. J. E. S. Moore on a preliminary expedition. The results obtained were so promising that in 1899 Sir Ray Lankester collected from those interested in the great lake and in African natural history a special fund amounting to more than 4700*l.* for further exploration, and obtained the assistance of a committee of naturalists in its administration. Mr. Moore was sent on a second expedition, well equipped and furnished with funds for the hiring of a steamer which had been placed on the lake by some enterprising pioneers. On Mr. Moore's return a third expedition was entrusted to Dr. W. A. Cunnington, of Christ's College, Cambridge, who has given special attention to the algæ and the smaller invertebrates of the lake. The money collected by Sir Ray Lankester has now been all spent, and an account rendered to the subscribers, together with a list (a copy of which we have received) of the numerous important publications on the fauna and flora of Lake Tanganyika, written by various experts who have undertaken the study of the collections brought home by Mr. Moore and by Dr. Cunnington. The most extensive results are those published by Mr. Boulenger, in five separate memoirs, on the fishes, which include a vast number of new species and genera; Mr. Moore's publications on the new gastropod molluscs and the anatomy of many of them, and on the reproduction of the fresh-water jelly-fish, Limnocnida; papers on the Crustacea, by Messrs. Cunnington, Calman, G. O. Sars, and Stebbing, and on the botanical collections by Dr. Rendle and Prof. G. S. West. All the collections have been placed in the Natural History Museum, although the trustees did not in any way contribute to the expenses of the expedition, which was a purely individual enterprise carried out by Sir Ray Lankester when director of the natural-history departments. It now remains for Dr Cunnington to give a clear and concise illustrated account of the natural history of Lake Tanganyika so as to embody the results of all this recent investigation in a readable form, with indication to the reader as to where he may find the various scattered memoirs in which the detailed descriptions are published.

PART iii. (June) of the Ceylon Marine Biological Reports is devoted to an account, by Messrs. T. Southwell and J. C. Kerkham, of an inspection of certain pearl-banks situated between Dutch Bay Point and Negombo, which are at present under the control of the Ceylon Government. The inquiry was conducted by the Ceylon Company of Pearl Fisheries, Ltd., which at present holds the main fisheries in Ceylon; and the chief results seem to be that these southern banks are exposed to the continuous influence of adverse surface-currents, and that the nature of the sea-bed is less well adapted for oyster-culture than is the case in the leased beds. Further, the close proximity

of the southern banks to the "overfalls" renders them unsafe as oyster-beds, although the actual *modus operandi* by which this is brought about is not at present understood.

In a note communicated to vol. xxxiii., No. 3, of the *Tropical Agriculturist*, Mr. E. E. Green states that an attempt is to be made to check the ravages on tea-plants in Ceylon of the beetle known as the "shot-hole borer" by introducing a predaceous beetle (*Clerus formicarius*), which is already well known as an enemy of pine-boring Scolytidæ. Mr. Green decided to try this beetle as an exterminator on account of the good reports of its value as a pest-ridder received from the United States. The experiment can, however, only be of a tentative nature, as the Clerus is an inhabitant of the temperate zone, and it remains to be seen whether it will thrive in the tropics. In a second note the Government entomologist states that in the Ambawella district of Ceylon camphor-plants are attacked by a scolytid allied to the shot-hole borer.

Several interesting additions to the British insect-fauna are recorded in the October number of the *Entomologists' Monthly Magazine*. Many years ago, it appears that Dr. David Sharp received from Chobham a water-beetle which he was unable to identify; this year he took a second example at Brockenhurst, and he finds both to belong to the continental *Laccobius scutellaris*. In the next article Mr. J. Edwards describes a new beetle from Horning, under the name of *Dryops anglicus*; later on, Mr. E. R. Speyer records the occurrence in Sussex of a number of specimens of the continental dragon-fly *Somatochlora metallica*, a species already known from Scotland, but not hitherto definitely identified in England. Finally, Mr. K. J. Morton mentions the occurrence in the west of Ireland of the trichopterid *Limnophilus fuscinervis*, which is quite new to the fauna of the British Isles.

C. Dawydoff contributes to the *Zeitschrift für wissenschaftliche Zoologie* (Bd. 93, Heft 2) a very elaborate memoir on the process of regeneration in the Enteropneusta. He considers that this group of animals, about which so much has been written recently from the morphological and phylogenetic points of view, affords an uncommonly convincing example of the untenability of Weismann's view that the power of regeneration is the result of natural selection. He states that when dredging for Ptychodera only the anterior portion of the body is usually obtained, the hinder end being commonly torn away, and concludes that under normal conditions the animal may lose its hinder end but hardly ever loses its head. He thinks that, according to Weismann's views, the animal should accordingly be able to regenerate the hinder end, but not the head end, while his own experiments show exactly the contrary to be the case, the anterior extremity being very readily regenerated after amputation, but not the posterior. The author's argument in this respect does not appear to us to be very convincing. The facts as stated suggest the possibility that anterior ends are cut off and collected by the dredge because they protrude, while the posterior ends remain buried, and that for the same reason the head ends are likely to be bitten off by fishes. If this be so, the fact that the anterior ends and not the posterior are regenerated fits in exactly with Weismann's views. We need to know something definite about the habits of the living animal before coming to a conclusion on this question. It will interest morphologists to know that Dawydoff finds in the mode of regeneration of the proboscis pores evidence in favour of Schimkewitsch's view that these organs are homologous with the "metanephridia" of annelids, consisting each of a mesodermal funnel and an ectodermal canal, the latter of which he regards as of more recent origin than the former.

Dr. W. F. Purcell contributes to the September number of the *Quarterly Journal of Microscopical Science* (vol. liv., part i.) a very interesting memoir on the development and origin of the respiratory organs in Araneæ. He finds that the first "leaves" of the "lung-books" in spiders appear on the free posterior side of the provisional abdominal appendages, quite outside of the pulmonary invagination, and deduces from this fact that the lung-books are derived from gill-books similar to those of Limulus. The tracheal system is supposed to have a two-fold origin, the pair of lateral tracheæ of dipneumonous spiders having been derived from the second pair of lung-books of tetrapneumonous forms, while the medial trunks of the tracheæ are equivalent in their entirety to metamorphosed entapophyses, *i.e.* to the invaginated ectodermal areas, lined by cuticle, which serve for the attachment of the ventral longitudinal muscles. Dr. Purcell's observations and conclusions should be of great value in settling the much-discussed question of the classification of the Arthropoda—if it ever is settled. The same number contains a further instalment of Mr. Goodrich's work on nephridia, dealing with these organs in Dinophilus and in the larvæ of Polygordius, Echiurus, and Phoronis, and some further notes on a trypanosome found in the alimentary tract of *Pontobdella muricata*, by Miss Muriel Robertson.

Among the shikar and natural-history notes contributed to the *Indian Forester* (August) is a note on the Burma mole rat, which, according to the writer, is a serious depredator of Para rubber trees, especially in young plantations, and is also reported to attack seedlings of teak, mango and jack trees. The animal, which is not definitely identified, but may be *Nesocia hardwickei*, is apparently confined to Burma and western Siam.

An important collation of the genus Cereus and its allies in North America, based upon observations in the field in Mexico and elsewhere, also of living material in the greenhouse in addition to herbarium species, is presented by Prof. N. L. Britton and Dr. J. N. Rose in the final part (No. 10) of the twelfth volume of Contributions from the United States National Herbarium. Following to a considerable extent the revision by Mr. A. Berger, except that they raise several of his subgenera to generic rank, the authors distinguish twenty-three genera, of which Cephalocereus, Echinocereus, and Lemaireocereus are the chief. The plant originally named *Cereus greggii*, that has a curious turnip-shaped root, is made the type of one of the new genera, Peniocereus. The same part contains descriptions of five new Mexican Crassulaceæ communicated by Mr. J. N. Rose, and a supplement to the monograph of North American Umbelliferæ by Drs. J. M. Coulter and J. N. Rose.

As might be expected, the officials of the Department of Agriculture in the Federated Malay States have been called upon for advice regarding pests of Para rubber trees. Mr. H. C. Pratt has collected further information on the ravages of the ants identified by him as *Termes gestroi*, which is published in Bulletin No. 3, together with methods of treatment. No insecticides can be recommended, but eradication of old tree stumps and carefully devised fumigation with arsenic and sulphur of the burrows leading to hollow stems have proved efficacious. Mr. W. J. Gallagher discusses in Bulletins Nos. 2 and 6

the root disease caused by *Fomes semitostus*, and a branch and stem disease which has not yet been traced to a specific fungus. The Fomes spreads from the old stumps of jungle trees, so that eradication of these is the only remedy, while excision of infected parts and treatment with Bordeaux mixture have proved effectual against the less dangerous stem disease.

A VARIED selection of microscopic accessories, apparatus for bacteriological and hæmatological investigation, and instruments for collecting natural-history specimens, is kept by Messrs. H. F. Angus and Co., 83 Wigmore Street, who have recently issued a well-illustrated catalogue of this part of their stock. The firm acts as agent for Messrs. Swift, Leitz and Zeiss, also for Dr. G. Grübler, of Leipzig. Another feature of the catalogue is the list of mounted specimens for the microscope, physiological, pathological, and botanical.

THE Francis Galton Eugenics Laboratory has published a lecture by its research scholar, Miss Ethel M. Elderton, entitled "The Relative Strength of Nurture and Nature," which was recently delivered in a course of lectures on national eugenics at the laboratory. By the method of correlation used by the lecturer and her colleagues, she claims to establish the fact that "overcrowding, bad economic conditions, bad physical and moral conditions of the parents, have practically no effect on the intelligence, eyesight, glands and hearing of the children." The results, indeed, show that the children of drunken parents are somewhat healthier and more intelligent than those of sober parents, and generally that the influence of environment is almost negligible compared with that of heredity. As the author admits, some of "these results are certainly startling and rather upset one's preconceived ideas."

IN a work entitled "Die Härte der festen Körper und ihre physikalisch-chemische Bedeutung" (Dresden: Theodor Steinkopff) Dr. Viktor Pöschl makes a valuable contribution to the study of an important physical character of solid substances, which has as yet scarcely received adequate attention from crystallographers and others interested in such matters. He describes a new form of sclerometer recently devised by him; in it the section under test is placed on a carriage and drawn under a diamond point, which may be lightly loaded, and the width of the resulting scratch is measured by means of a high-powered microscope. He gives the results of a series of experiments made upon various minerals and metals. It is interesting to note that the apparently wider scratch made perpendicular to the trace of the cleavage plane is due to incipient cleavage cracks, and that the direction parallel to the trace is really the one of least hardness. Dr. Pöschl discusses with considerable acumen the connection between hardness and solubility, chemical composition, crystal form, and density.

PROF. ECKERT publishes a new "isochronic" chart of the world in the September number of *Petermann's Mitteilungen*. The first part of an article on the construction of such maps, dealing with the history of their development and with modern methods of arranging and reducing the *data* upon which they are based, accompanies the chart.

THE October number of *Travel and Exploration* contains the first part of a paper, by Dr. M. A. Stein, on his journey through the Taklamakan Desert, entitled "Across the 'Sea of Sand.'" The paper gives a graphic account of the incidents of the journey, and is illustrated by excellent photographs.

MR. ELLSWORTH HUNTINGDON contributes an article on the Russo-Afghan frontier region to the September number of the *National Geographic Magazine*. The paper forms the first part of an account of the "Afghan Borderland," based chiefly on journeys made by the author in recent years. Speaking of eastern Persia, Mr. Huntingdon remarks that "the inhabitants stagnate and play no part in the present history of the country except as pawns to be harried by the Afghans, cowed by the Russians, or cajoled by the English."

THE British School of Archæology at Athens has made further important discoveries on the site of the city of Sparta. The great temple of Artemis Orthia has been now completely cleared. The site known as the Menelaion, at Therapne, about two miles south-east of Sparta, has been partially examined. The sanctuary of Menelaus and Helen, mentioned by Herodotus, Livy, Pausanias, and Polybius, was a favourite resort of the Spartan ladies, where the goddess was believed to confer the gift of beauty on her worshippers. The discovery of Mycenæan remains on this site suggests that this was the famous palace of Menelaus, and this provisional identification is corroborated by finds of bronzes, votive double-axes, lead figurines, and terra-cottas.

IN the fourth Bulletin of the Archæological Survey of Nubia for the current year Dr. G. A. Reisner continues his account of a group of prehistoric cemeteries at Koshtamna, in Nubia. The excavations disclosed two remarkable sets of graves, one simple archaic pits with contracted burials, and the second mud-cut chambers with mummies deposited in an extended position. Unfortunately, many of the former have been destroyed by cultivators in search of fertilising matter for their fields, but those which remain extend from the middle pre-dynastic period down to that of the late Empire. The mud-cut graves represent the period from the earliest Ptolemaic down to Christian times. Drs. G. Elliot Smith and D. E. Derry have, as usual, reported upon the physical characters of the human remains. These show a considerable intermixture of the Negroid with the indigenous type, which has resulted in a progressive shortening of the cranium. Three distinct negro types were observed—one small and relatively short-headed, the second taller and dolichocephalic, the third a big, massive, broad-faced, large-headed variety. The occurrence of spinal tuberculosis in this region is now definitely established, and the present investigations have pushed back the diagnosis of this disease another thousand years, as far back as the period of the Ancient Empire.

THE Transactions of the Royal Society of South Africa for July last contain a useful paper by Mr. R. T. A. Innes, in which he endeavours to show what reductions applied to the Transvaal air-temperatures will in the mean for the whole country reproduce the assumed temperatures at sea-level. On squared paper points were placed for the actual temperatures recorded at different altitudes; a curve drawn through these to the point at sea-level approximated closely to a parabolic form, and from this curve the reductions to sea-level were taken, the figures below 2500 and above 6000 feet being mostly derived by extrapolation. Three maps are given showing the distribution of sea-level temperatures during the warmest and coldest months of the year and for the mean of the year. The isotherms differ considerably from those drawn by Dr. Buchan; in the warmest month, for instance, Dr. Buchan gives the sea-level temperature of the western border as about 92½°, whereas Mr. Innes gives it as 85°. The author remarks that, in the absence of data, Dr. Buchan must have relied on the

analogy with other continental areas, but that the effects of the South African plateau and of the great wind movement alter the circumstances. The present tables, based on data for two years, are, however, only considered as a first approximation.

WITH reference to suggested reforms in meteorological methods, we referred in a recent issue to a proposal made by Prof. A. G. McAdie in the *U.S. Monthly Weather Review* of November, 1908, to adopt the centigrade (not Celsius) scale and the metric system for temperature, wind, rain, &c., and 1000 on an arbitrary scale of units as the equivalent of the normal atmospheric pressure of 760 mm. This proposal has led to several interesting communications on the subject in the *Monthly Weather Review* of March last. Mr. M. E. J. Gheury (Eltham) prefers, for reasons given, the units at present generally adopted for meteorological observations in this country. Mr. H. H. Clayton (Blue Hill, U.S.) prefers the metric system, but with regard to temperature he renews a suggestion, made in NATURE in 1899 (vol. lx., p. 491), that the Kelvin thermometer scale (freezing point 273°, boiling point 373°) should be used, and he points out that the adoption of this scale with the metric system was recommended by a committee of the British Association in 1904. Prof. Köppen (Hamburg) approves of the use of the metric and centigrade systems by England and America, but would express all barometric measurements by ordinary general units of force, taking as unit the product gram × acceleration of gravity. In connection with the above notes it may be stated that from the commencement of this year the Meteorological Office has adopted centigrade degrees on the absolute scale (from −273°) and pressure in C.G.S. units, or megadynes per square centimetre, as most suitable for the publication of values in the investigation of the upper air.

NO. 15 of the *Verhandlungen der deutschen physikalischen Gesellschaft* contains two contributions from Prof. W. Nernst and his pupil, Dr. H. Levy, dealing with the physical properties of water from the thermodynamic point of view. Assuming that the deviations of water vapour from the "perfect gas" laws are due to the formation of a certain proportion of double molecules in the vapour, they show that it is possible to give expressions for the density and pressure of the vapour and the latent heat of evaporation of the liquid, within the interval 0° C. to 100° C., the latent heat of fusion of ice, and even for the variation of the specific heat of water with temperature, which show an accuracy far greater than has been attainable with the help of any previous theory.

SOME experiments by Prof. Rateau on fluid pressure on inclined planes are discussed in an article in *Engineering* for September 17. The mathematical solution for an ideal fluid shows that a portion of the fluid is always deviated so as to pass over the leading edge, whatever may be the inclination of the plane. Rateau's experiments show that, for considerable angles of incidence, the fluid actually spills over both edges, whilst for smaller angles the flow takes place wholly past the trailing edge. Using a rectangular plane 30 by 50 centimetres by 1·25 millimetres thick, from 0 to 29 degrees the flow is solely over the trailing edge; from 29 to 36 degrees the conditions are absolutely unstable; afterwards a proportion regularly escapes past the leading edge. Further, the smaller the angle of inclination the nearer does the centre of pressure lie to the leading edge of the plane, the limiting value for the above plane being 0·236 of the width of the plane for zero inclination. A plate having a flat ship-shaped section shows a very marked retrogression of the centre of pressure at inclinations less than 7 degrees, the centre of pressure moving rapidly towards the trailing edge. A blast of air was used in these experiments, and results were also obtained for the total pressure and for the friction.

FROM an article on the Paris Aviation Exhibition in *Engineering* for October 1 we note a point which may possibly require more attention than it has hitherto received. In the case of an engine running with no fly-wheel except the propeller, the blades near the root may be subject to a considerable stress alternating with every revolution of the engine. The amount of this stress will depend on the number of cylinders the engine has, and it may be necessary to make the propeller-blades considerably stronger with two- and three-cylinder engines having no fly-wheel than with others having a more even turning moment. Wooden propellers seem more in favour than those of metal, and probably are more suitable, as wood is well able to withstand the above-mentioned stresses, and it is easy to make the blade strong at the root without excessive weight. The wreck of the dirigible *République* and the death of four men composing her crew, owing to a broken propeller, shows that danger from this cause is not imaginary, and the results in an aëroplane would probably be at least equally disastrous. We also note from the same article that although the cross-Channel flight and the record for distance have been performed with air-cooled motors, the water-cooled engines are in a very large majority at the exhibition. Weights per horse-power range from 2·2 lb. in the Gnome to 7·5 lb in the Renault, both being air-cooled. The water-cooled engines range from 4 lb. in the Darracq to 6·1 lb. in the Bayard, excluding radiator and water.

THE Carnegie Institute of Washington has now published the eighth volume of the "Index of Economic Material in Documents of the States of the United States." It deals with the State of Illinois, and covers the years 1809–1904. This index has been prepared by Adelaide R. Hasse, of the Librarian Department of Public Documents in the New York Public Library, and deals only with the printed reports of administrative officers, legislative committees, special commissions, and governors' messages. The term "economic" has been given a liberal interpretation, and the index will constitute a useful addition to the resources of students of American history.

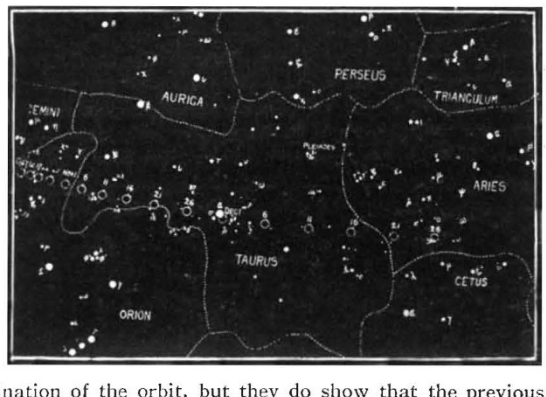
WE are asked to state that a new edition (the third) of "A List of Official Chemical Appointments" is being prepared by the registrar and secretary of the Institute of Chemistry, and that corrections and additions should be sent as soon as possible to the registrar of the institute, 30 Bloomsbury Square, W.C. Suggestions which may increase the usefulness of the list will be carefully considered.

SINCE the appearance in the last number of NATURE of particulars as to forthcoming books of science, information has reached us of the following additional works:—In *Agriculture*.—"Principles of Agriculture: a Text-book for Lecturers on Agriculture, Rural Schoolmasters, Young Farmers, and Students of Agriculture," J. M'Cutcheon, illustrated (E. and S. Livingstone). In *Biology*.—"Window and Indoor Gardening," T. W. Sanders; "Mushrooms and their Cultivation," T. W. Sanders; "Bees for Profit and Pleasure," H. Geary (W. H. and L. Collingridge); "The Mammals of Somaliland: a Book for Naturalists and Sportsmen," R. E. Drake-Brockman, illustrated (Hurst and Blackett, Ltd.); "The Mutation Theory," Dr. H. de Vries, 2 vols., illustrated (Kegan Paul and Co., Ltd.).

In *Geography and Travel.*—"The Basutos: the Mountaineers and their Country," Sir Godfrey Lagden, 2 vols., illustrated (Hutchinson and Co.); "Mediæval Researches from Eastern Asiatic Sources: Fragments towards the Knowledge of the Geography and History of Central and Western Asia, from the Thirteenth to the Seventeenth Century," E. Bretschneider, 2 vols. (Kegan Paul and Co., Ltd.). In *Mathematics and Physical Science.*—New volumes of the International Scientific Series:—"Music: its Laws and Evolution," J. Combarieu; and new editions of "Light and Photography," Dr. H. Vogel and A. E. Garrett; and "Colour-blindness and Colour-perception," C. W. Edridge-Green, illustrated; also "An Easy and Concise Guide to the Starry Heavens," D. M'Ewan, illustrated (Kegan Paul and Co., Ltd.).

OUR ASTRONOMICAL COLUMN.

EPHEMERIS FOR HALLEY'S COMET, 1909c.—A corrected ephemeris for Halley's comet is published by Mr. Crommelin in No. 4359 of the *Astronomische Nachrichten* (p. 249, September 28). This ephemeris, like that published in No. 4330 of the same journal, is based on the elements published, for the Astronomische Gesellschaft prize, under the pseudonym "Isti mirantur stellum," Messrs. Cowell and Crommelin, it transpires, being the calculators. The new observations do not yet cover a sufficiently long arc to permit of an independent determination of the orbit, but they do show that the previously published elements are correct except that the date of perihelion passage must be advanced 3·4 days, thereby making it 1910 April 20·0 (G.M.T.); this modification has been taken into account in preparing the present ephemeris, which covers the period August 28 to December 26 in five-day steps. An extract follows:—



Ephemeris.

Berlin M.T	R.A. (1910·0)	(decl. 1910·0)	log r	log Δ	Magnitude
	h. m.	° ′			
Oct. 17·4 ..	6 9·7	... +16 57	... 0·4785	... 0·3982	... 14·7
,, 22·4 ...	6 5·1	... +16 56			
,, 27·4 ...	5 59·1	.. +16 54	... 0·4603	... 0·3447	... 14·2
Nov. 1·4 ...	5 51·7	... +16 52			

From this we see that the comet is at present in the northern limits of Orion, and is some 280 and 230 million miles from the sun and earth respectively; also that it is approaching the sun and the earth at the respective rates of about 1·12 and 2·7 million miles per day. The accompanying chart shows its positions in relation to the constellations so far as Mr. Crommelin's ephemeris gives them.

CHANGES ON MARS.—In No. 4359 of the *Astronomische Nachrichten*, M. R. Jonckheere, of the Observatoire d'Hem (Roubaix), gives a drawing of the south polar cap of Mars, executed on September 2, showing the new "land" which he discovered in longitude 120°. He points out that the crevasse and greyish region observed by M. Jarry Desloges are produced by the emersion of the two "lands," Argyre II. (longitude 60°) and the new one, from the polar snows. For the newly discovered area in longitude 120° he proposes the name "Stella," suggested by its brilliant appearance.

In the same journal M. Antoniadi records his observations, on September 19, of the Mer du Sablier, which to him appeared as Dawes recorded it in 1864. As Prof. Lowell's observations and photographs show it of a very different form during the period 1894–1907, M. Antoniadi suggests that periodic changes of form, probably irregular, may take place in this feature.

A number of interesting observations of the planet are recorded in No. 22 of the *Gazette Astronomique*, by M. P. L. Dupont, of Hoboken, Antwerp.

REMARKABLE METEORS.—No. 22 of the *Gazette Astronomique* contains the records of three remarkable meteors seen in Denmark during August. The first was at 9h. 25m. (C.E.T.) on August 19, and it was bright enough to illuminate the surrounding landscape. Apparently its actual path was from 128 km. above the town of Sorö, in Zealand, to 30 km. above a point on the coast about 22 km. west of Sorö; thus the path was nearly vertical, and the velocity was about 33 km. per second. The other two meteors were seen on the same night at 9h. 17m. and 9h. 38m. respectively. The former was attended by a noise similar to that made by escaping steam, whilst the second one was extraordinarily slow, and was seen for fifteen seconds, during which it passed, nearly horizontally, from 190°, +23° to 152°, +32°.

THE URSA-MAJOR SYSTEM OF STARS.—Following up Dr. Ludendorff's conclusion that the stars β, γ, δ, ϵ, and ζ Ursæ Majoris belong to a definite system of stars moving along parallel lines in space, Mr. Ejnar Hertzsprung has investigated the conditions for other stars having similar proper motions, and finds that a number of other stars probably belong to the same system. Among these may be noted β Aurigæ, Sirius, α Coronæ, 78 Ursæ Majoris, and Groombridge 1930, while κ Boötis is suspected. A number of the stars, nine out of fifteen given, are double, and a tabulation of the magnitudes and spectral classes suggests a development of spectrum, from one star to another, with an attendant decrease of brightness (*Astrophysical Journal*, vol. xxx., No. 2, p. 135).

SEARCH-EPHEMERIS FOR WINNECKE'S COMET.—A continuation of the search-ephemeris for Winnecke's comet is published by Herr C. Hillebrand in No. 4360 of the *Astronomische Nachrichten*. As the present southerly declination (−20°) is increasing, it is not likely that the comet will be generally observed in the northern hemisphere.

THE NATURE OF SOLAR FACULÆ.—An important result concerning the nature of bright faculæ seen on the sun's disc is published by M. Deslandres in No. 11 of the *Comptes rendus* (p. 493, September 13). The main conclusion is that the vapours in the bright faculic areas are, relatively to the surrounding dark areas, descending. This result has been deduced from the measures of the motion-displacements shown on negatives taken with the Meudon spectro-register of radial velocities, the pure K_3 line being employed.

Exhaustive measures of the absolute velocities have not been made, because to measure completely the whole disc on one negative would entail some 36,000 settings, and the Meudon staff is not sufficiently large for such an enterprise. But the measures of a number of displacements on bright areas near the centre of the disc, where the line-of-sight motions are independent of the solar rotation, indicate that the result is general. A diagram which accompanies the paper shows this result for a faculic area photographed on June 4.

M. Deslandres discusses this result in comparison with atmospheric movements on the earth, and suggests that it is in accordance with theory. When a mass of vapour descends it becomes compressed, and therefore brighter; when ascending, its pressure is decreased, and consequently the vapour becomes cooled and less bright.

The investigation of the nature of spots, on the same lines, has not yet been undertaken, M. Deslandres looking upon spots as a secondary phenomenon following the production of faculæ.