with passages giving access to cells, and store-chambers, most of the houses being wholly or partly underground. In this country we have examples of similar constructions in the Dene-hole chalk quarries of Darenth Wood and those near Chislehurst, the Cornish excavations known as Fogous, the cave in the Isle of Egg, one of the Hebrides, the scene of the terrible massacre of the Macdonalds by the Macleods, and that on Rathlin Island, where a similar tragedy occurred during the campaign of Essex in 1575, of which Froude supplies a graphic narrative.

From structures such as these Mr. Baring-Gould passes on to the cliff castles occupied by the ruffianly Routiers and Free-Companions in France, and the many caves and similar shelters tenanted by hermits and ascetics, robbers, and outlaws in other parts of Europe. The church has also utilised many subterranean excavations of the same kind, such as the monolithic chapel of St. Emilion in Dordogne, and the still more remarkable underground churches at Plouaret in Côtes-du-Nord, and the Spanish example at Cangas-de-Ones, near Oviedo, where a prehistoric dolmen is used as a crypt.

The value of this interesting, if rather discursive, book is much increased by the series of excellent sketches, most of which were drawn by the author on the spot in his exploration of this remarkable series of monuments.

MAJOR GEORGE LAMB, I.M.S.

WE regret to record the death, which took place at Edinburgh on April 11, of Major George Lamb, director of the Pasteur Institute of India, Karauli (Punjab), in his forty-second year. He was a distinguished graduate of the University of Glasgow, and for some time demonstrator of anatomy in that university, but resigned this post in order to enter the Indian Medical Service. From the first he strenuously applied himself to research, and the extent and nature of his published work strikingly attest his great ability and originality, and his indefatigable industry. Within a few years after joining the service, he had made his mark by researches on Mediterranean fever in India, typhoid fever, and anti-typhoid vaccine, and other subjects connected with the scientific treatment of disease. He was subsequently continuously employed in important scientific inquiries initiated by the Government of India.

Nearly ten years ago Major Lamb was appointed head of the laboratory for the investigation of snake poisons, and became one of the chief authorities on this subject. The results of his observations appeared in about a dozen papers, which deal with the venoms of Russell's viper, the cobra, and the banded krait, their action on the blood plasma and corpuscles and on the nervous system, and with the specificity of their antisera. He was joint author (with Dr. C. J. Martin, F.R.S.), of the section on "Snake Poison and Snake Bite" in the "System of Medicine," edited by Sir Clifford Allbutt and Dr. Rolleston.

Major Lamb's greatest work was done in connection with the Plague Commission to which he was appointed, as senior member, in 1905. He was responsible for the carrying out of that detailed and widespread inquiry into the mechanism of the epidemic spread of plague in India, the results of which have been published in five reports, the last only recently issued. He initiated and throughout bore a prominent part in the long series of experiments and observations which resulted in the conclusive proof of the transference of plague from rat to rat, and from rats to man by the agency of fleas. Since his appointment as director of the Pasteur Institute of India, which took place when the plague inquiry was nearing its close, Major Lamb devoted himself largely to the subject of hydrophobia, and introduced important modifications in the treatment of the numerous cases annually dealt with at that institute.

Major Lamb has left an enduring mark upon three main lines of research—snake venoms, plague, and hydrophobia—each of outstanding importance in Indian medical work, to which he devoted himself successively with characteristic zeal, patience, and skill. His frank and genial manner, his clear grasp of, and self-sacrificing devotion to, the work he had in hand called forth, in those privileged to work with or under him, loyal and enthusiastic cooperation. His wide knowledge of medical science in its application to Indian problems will be much missed in medical and scientific circles both at home and in India, and his friends will deplore the loss of one who had a most genial and captivating personality.

J. H. A.

NOTES.

A PRELIMINARY programme has been issued for this year's meeting of the British Association, which, as already announced, is to be held at Portsmouth on August 30 and following days. The opening meeting will be held in the Town Hall on Wednesday evening, August 30, when Sir William Ramsay, K.C.B., will assume the presidency and deliver his inaugural address. In the same hall the first evening discourse will be delivered on Friday evening, September 1, by Mr. Leonard Hill, F.R.S., on "The Physiology of Submarine Work," and the second on Monday evening, September 4, by Prof. A. C. Seward, F.R.S., on "Links with the Past in the Plant World." The reception room and administrative offices during the meeting will be established in the Connaught Drill Hall, which is centrally situated close to the Town Hall, and within easy access of all the meeting rooms which will be occupied by the sections. The president will have the assistance of a strong body of representatives of the administrative, ecclesiastical, naval and military interests of the town and neighbourhood, headed by H.R.H. Princess Henry of Battenberg and the Mayor, Alderman T. Scott Foster. An afternoon reception and an evening *fête* are announced to be given by the Mayor, and facilities will be arranged for members to visit sites and objects of scientific, historical, and national interest in Portsmouth and the neighbourhood.

A COMMITTEE for the study of the sea was appointed in 1909 by the Italian Society for advancement of science. Its work was so active and promising that a few months later the committee was converted by an Act of Parliament into an institution of the Italian kingdom. The Regio Comitato Talassografico Italiano is to be concerned with investigations of the Italian seas from the physical and chemical points of view as well as from the biological. Great importance will be attached to practical questions concerning the navigation and the fisheries. Investigations of the high atmosphere will also be made in connection with aviation. The president of the committee is the Marine Minister, and representatives of the chief institutes, academies, and societies which take interest in sea investigations have been appointed as members. In addition the committee has a scientific staff of its own; it receives a yearly grant from the Italian Government of 60,000 lira (2400*l.*); and the ships for the cruises are supplied by the Italian Royal Navy. Four cruises in the Adriatic sea have

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taken place already, the programme of which was agreed upon with the delegates of the Austrian Government. We understand that a fifth cruise will soon start.

IT is announced that Mr. J. H. Grisdale has been appointed director of the Dominion Government's Experimental Farm System, in succession to Dr. William Saunders, C.M.G., who has retired.

THE death is announced of Colonel I. C. Walker, who from 1881 to 1890 was Chief Conservator of Forests in Madras, and from 1895 to 1898 Inspector-General of Forests in Mysore.

WE regret to see the announcement of the death, at ninety-one years of age, of Mr. T. Rupert Jones, F.R.S., formerly professor of geology at the Staff College, Sandhurst, and the author of many papers and essays on geological subjects.

AT the meeting of the Faraday Society to be held on Tuesday, May 2, Mr. A. Scott-Hansen, the well-known Norwegian engineer, will deliver a lantern lecture on "Hydro-electric Plants in Norway, and their Application to Electrochemical Industries." On the same evening a paper is down for reading by Mr. Verdon Cutts, of Sheffield, entitled "Electrometallurgy in the Steel Foundry."

ON Thursday next, April 27, Prof. R. W. Wood, of the Johns Hopkins University, will begin a course of three lectures at the Royal Institution on "The Optical Properties of Metallic Vapours," these being the Tyndall lectures. The Friday evening discourse on April 28 will be delivered by Prof. W. M. Flinders Petrie on "The Revolutions of Civilisation," on May 5 by Prof. M. O. Forster on "New Organic Compounds of Nitrogen," and on May 12 by Prof. William Stirling on "Biology and the Kinematograph."

THE annual conversazione of the Selborne Society will be held on May 5, in the theatre and halls of the Civil Service Commission, Burlington Gardens, W. This year there will be very interesting exhibits of rural industries, including the prehistoric occupation of Flint Knapping, whch still survives in Suffolk, where gun flints and strike-a-lights for tinder boxes to export to tropical countries is still carried on. The president, Lord Avebury, will take the chair in the theatre, and a lecturette will be given on "The Eggs of Butterflies and Moths," illustrated by photographs by Mr. F. Noad Clark.

THE 1912 Boston Electric Show will be held in Boston, Massachusetts, U.S.A., from September 28 to October 26, 1912. It will occupy the whole of the great Mechanics' Building, with more than 105,000 square feet of exhibit floor space and accommodations for more than 100,000 visitors at one time. This building is the largest exhibition structure of the kind in the world. The organisation of this electric show, the financial responsibility of its management, and the scope and policies of the great undertaking, are under the auspices and supervision of the Edison Electric Illuminating Company of Boston.

AT the Plymouth Laboratory of the Marine Biological Association, the usual Easter vacation course in marine biology was conducted by Prof. W. Garstang, and was attended by seventeen students from Oxford, Cambridge, the Imperial College of Science, Leeds University, and Bedford College. Dr. C. Shearer, of Trinity College, took a class of six Cambridge students to Plymouth for a course of work on experimental embryology. Artificial parthenogenesis of the eggs of *Echinus esculentus* was successfully carried out by the students, and a number of experiments on the lines of work of Loeb and Driesch were repeated. As is usual at this time of the year, the research tables have been well occupied, eleven visiting naturalists, in addition to three on the permanent staff, having been engaged in zoological investigations.

THE first non-stop flight from London to Paris was made, on April 12, on a Blériot monoplane by M. Pierre Prier in 3h. 56m. M. Prier, who is the chief instructor of the Blériot School at Hendon, left that ground at 1.37 p.m., taking a course for Dover *via* Hampstead, Highgate, Greenwich, Chatham, and Canterbury. There was a slight north-east wind as he started, which changed to a north-west by the time he reached Dover, at 2.50 p.m. Thirty minutes later he was over Boulogne, and steering a straight course over Abbeville and Beauvais for Paris, where he arrived at 5.33 p.m., making a perfect landing in front of the Blériot sheds at the Issy-les-Moulineaux aviation ground. The height maintained throughout was between 1500 and 2000 feet, except at the Channel crossing, when he rose to more than 3000 feet. The machine was fitted with a 50 horse-power Gnome motor and three special tanks for an extra supply of petrol, of which, however, barely half was used. M. Prier, who found his way by means of a compass designed by M. Blériot and a map, suffered no inconvenience throughout the journey except slight inflammation of the eyes, due to his neglecting to equip himself with goggles.

THE council of the Central and Associated Chambers of Agriculture has appointed a committee to report upon the desirability of the adoption of uniform weights and measures. It is not yet clear how this inquiry will be conducted. On previous occasions when local bodies have been consulted, the reports received from them have been of a contradictory character, so that it has appeared hopeless to propose a system likely to meet with general satisfaction among agriculturists. It is improbable that the metric system would meet with much support. An opinion appears to prevail in some quarters that the weights specified in the Corn Returns Act of 1882 for a bushel of wheat, barley, and oats, respectively, are in some way prejudicial to the cereals market in this country. There is also a proposal to apply the term "hundredweight" to the cental of 100 lb., and to fix the stone at 10 lb. instead of 14 lb., as a preliminary to decimalising our present system of weights. A Select Committee of the House of Commons appointed to inquire into the various weights and measures used in the sale of grain reported in 1893, after a lengthy investigation, in favour of the retention of the weights specified in the Corn Returns Act, and also recommended that the sale of all cereals should be in terms of the hundredweight of 112 lb., and that no other weight or measure of capacity should be referred to in any sale.

DR. JOHN DUNCAN GREGORSON, whose death is reported to have taken place in the recent massacre of the British mission on the Assam frontier, was born in Lochgilphead, Argyllshire, in 1871. He entered the University of Edinburgh in 1889, and graduated M.B., C.M., in 1894. After a course of post-graduate study, he was for several years in practice in Leytonstone, but formed a desire for work in the domain of tropical diseases, which an offer made to him about eight years ago enabled him to fulfil. During this period he was medical officer to a group of tea estates located around Tinsukia, in Upper Assam, and two years ago published, in the Journal of Tropical Medicine, a paper giving some interesting notes on the methods used in combating disease among the coolies imported from

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India to work on the tea gardens. The population under his care amounted to about 25,000, consisting of many races from widely different parts and climates of India, scattered over a large extent of country in settlements, each containing about 2000 inhabitants. The part of Assam in which Dr. Gregorson laboured has a climate admirably suited for the spread of malaria and ankylostomiasis, which, along with cholera and dysentery, were the chief diseases he had to combat. His work was carried on under very considerable difficulties in regard to the extent of country to be traversed and number of cases to be seen and treated, but he dealt with the various problems presented in a vigorous and effective manner. His success was evidenced by the respect in which he was held throughout the district, and by his having been invited to sit on a Government commission to inquire into the conditions at a garden where the death-rate had been exceptionally high.

THE Secretary for Scotland has appointed the following to be a committee to consider and report on certain questions relating to forestry in Scotland, viz. :—Sir John Stirling-Maxwell, Bart. (chairman), the Right Hon. Lord Lovat, C.B., K.C.V.O., the Right Hon. R. C. Munro-Ferguson, M.P., Mr. John D. Sutherland, Sir John Fleming, Sir Matthew Wallace, and Mr. R. H. N. Sellar. Mr. H. Warre Cornish, Dover House, Whitehall, S.W., will act as secretary to the committee. The terms of the reference to the committee are as follows :—"To report as to the selection of a suitable location for a demonstration forest area in Scotland; the uses, present and prospective, to which such area may be put (including the use that may be made of it by the various forestry teaching centres in Scotland); the staff and equipment required for successful working; the probable cost; and the most suitable form of management. To report as to any further steps following upon the acquisition of the said area which, in the opinion of the committee, it is desirable should be taken with the view of promoting sylviculture in Scotland, due regard being had to the interests of other rural industries."

IN *The National Geographic Magazine* for February Mrs. M. L. Oliver gives an interesting account of the remarkable Snake Dance performed by the Hopi Indians at the pueblo town of Oraibi, illustrated by a valuable collection of photographs. This is one of the fertility rites fully described by Prof. J. G. Frazer in the last edition of his "Golden Bough," the legends indicating that the snakes, the progenitors of the tribe, are conciliated as representing the earth spirits. The dance is performed by members of the Antelope clan and by the Snake priests. The latter dance with live rattlesnakes in their mouths, and these at the close of the rite are released at the four points of the compass to wander where they please in the desert. The dance is followed by ceremonial ablution and the liberal use of a powerful emetic to remove the taboo from the officiants.

The Sarawak Museum Journal, of which the first number was issued in February last, makes a good start with a collection of interesting papers describing the resources and people of the State. In the ethnological notes we find a full account of the remarkable Tau Tepang superstition which is current among the sea Dyaks, and particularly among those tribes which are furthest removed from civilisation. The legends of its origin are not uniform. One story tells that a great snake once devastated the land, and that its spirit announced that anyone who succeeded in eating its tongue would gain the hereditary faculty of becoming a Tau Tepang, that is to say, a person whose head possessed the power of leaving its body, and after working mischief during the night, could return to its owner in the morning. Hence all kinds of evil are attributed to such people, who are rigorously excluded from intercourse with their neighbours; and every paddy farm must be carefully guarded with charms, which contain sharp bamboo spikes intended to pierce the face and eyes of any of the Tau Tepang community who may attempt to injure the crops.

FRANZ DE ZELTNER gives in *L'Anthropologie* (tome xxii., p. 1) an illustrated account of some caves containing mural paintings which he has discovered in the French Sudan, near Bamako, Boko, Boudoufo, and Kita. They occur near the entrance of rock shelters, so that no artificial light was needed to make them; the colours employed are yellow ochre, red, indigo blue, black, white, and rarely pink; they were laid on with the fingers, as there are no brush marks, and there is no evidence that grease was used in mixing the colours. He found only eight realistic figures, and these occur in only one shelter; everywhere geometric designs predominate. The conventional representations of man and animals recall the rock engravings of Sahara and Egypt. There is no correlation between the different signs, and their grouping appears to be quite haphazard. The author does not believe that the caves ever were dwelling-places, and he definitely rejects the hypothesis of a magical and totemic origin of the painting; indeed, he states that "nothing in the traditions or actual life of the blacks confirms it, quite the contrary, since the representation of their protecting animal is forbidden to them as well as contact with it." New discoveries are recorded of rock pictographs in Aragon and Estremadura (*L'Anthropologie*, *loc. cit.*, p. 119). At present only a preliminary survey has been made; the paintings appear to correspond with the later phases of palæolithic decorative art, indeed, many of them recall the conventional designs of Mas d'Azil, which mark the decadence of the great art of palæolithic times. No traces were found of a neolithic or any subsequent period.

PROF. PILLSBURY contributes an interesting paper to the current number of *The Psychological Review* on the place of movement in consciousness. In America, the modern tendency to explain mental processes in terms of movement may be said to have begun with James's well-known theory of the emotions. It has since been extended by Dewey and his school, and has been lately utilised to give impetus to pragmatism in philosophy. Space, even from the time of Berkeley, has received a motor interpretation. Time and rhythm have also been referred to movement. Even memories have been explained as a reinstatement of past movements, and the next logical step would be, as Prof. Pillsbury points out, to suggest that the true quality of sensation is motor. "All that is necessary is to assume that each sense organ is connected with definite muscles, that these muscles are excited whenever the sense organ is stimulated, and that the colour or tones that we see or hear have their origin in some group of muscles rather than in a sense organ or in the cortex." The author points out that nothing is gained by such conceptions if we hold the current view that movements themselves are only known through sensations. He cites the results of recent experiments on the motor cortex of living man, which show that the motor impulses originating from the motor cortex contribute nothing directly to consciousness. "Granted that movements are only known by the kinæsthetic sensations, to translate all conscious qualities into motor terms merely transforms all other sorts of sensation into the one sense, and that a sense

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relatively poor in qualities." But where the motor theory most completely breaks down is when it attempts to explain functional problems. Meaning, thinking, recognising, have all been tentatively explained in terms of motor theory. Now "movements in and of themselves have no meaning, are not immediately recognised nor understood. These functions require just as much explanation when they attach to movements as to any mental process." Function is evidently something more than movement; use is something more than structure. As the author points out, "more important than either sensation by itself or movement by itself is the fact that consciousness is always an organised system."

IN *The Entomologist's Monthly Magazine* for April Mr. G. H. Verrall adds one hundred species of Diptera to the British list. Of these, seven are entered as new species, but since there is no diagnosis, these would appear to be *nomina nuda*, which may be appropriated by anyone else.

THE Bergens Museum *Aarsberetning* for 1910 contains a brief account of the recent Atlantic cruise of the *Michael Sars*, financed and directed by Sir John Murray. The collections, it appears, are to be worked out at the Bergen Museum, where the types of new forms will be preserved.

ACCORDING to an article by Dr. Bather in the March number of *The Museums Journal*, the Muses are to have no roof over their heads in some of their habitations, for the movement in favour of open-air museums is stated to be making distinct progress. Such establishments will be, of course, for the display of antiquities not liable to deterioration by exposure to the weather, and they will certainly have the advantage of cheapness. It is satisfactory to note that Dr. Bather considers the exhibition of local objects should be the main function of local museums, their first duty being "to interest the people of their city or county in their own history."

THE *Bulletin Scientifique de la France et de la Belgique* is making a praiseworthy effort to advance the assimilation of current scientific literature by publishing an annual "Bibliographia Evolutionis," which is to record not only the titles of books and papers, but likewise to give a *précis* of their contents. The present issue, of which we have been favoured with a copy, deals with the year 1910, and contains 345 items. The compilers are to be congratulated on the celerity with which they have accomplished this work, and are entitled to the gratitude of all students of subjects connected with evolution, both as regards zoology and botany.

IN connection with the arrival of the first living elephant-seal at our own Zoological Gardens, to which reference has been made in NATURE already, it is interesting to note that, according to *Science*, half-a-dozen young elephant-seals from Guadalupe Island, on the Californian coast, have been received at the New York Aquarium in excellent condition. Although not more than nine months old, these young monsters average about 250 lb. in weight, and measure from 4½ to 5 feet in length. Although described as a distinct species (*Macrorhinus angustirostris*), the Guadalupe sea-elephant is identified by Mr. Rothschild with the typical *M. leoninus* of Juan Fernandez, the Crozet form, to which the London specimen belongs, being regarded by him as a race of the same species.

THE habits and life-history of pycnogonids (Pantopoda) form the subject of an illustrated article by Mr. H. Prell in the third part of the Bergens Museum *Aarbog* for 1910. If kept in cold water, the members of the genus Nymphon flourish in aquariums. All of them crawl, but a few are also able to swim by the aid of swimming-hairs, which are more strongly developed in males than in females. They feed entirely on Hydrozoa, more especially Campanulariidæ, and the curious mode in which these organisms are seized and devoured is well shown in the illustrations. The species of Pycnogonum which are parasitic on sea-anemones, the juices of which they suck, are, on the other hand, much more difficult to keep in confinement.

THE accepted classification of the brittle-stars (Ophiuroidea), according to Mr. H. L. Clark in a paper, of 302 pages, published as Bulletin No. 75 of the U.S. National Museum, is little short of an absurdity, nor has any attempt been made for the last thirty years to put it on a rational basis. Unfortunately, the author has not found himself in a position to remedy this unsatisfactory state of affairs, and he has therefore followed a classification based on a compilation of the work of Lyman and some of his successors. Mr. Clark's paper relates to the North Pacific representatives of the group, of which an enormous collection, comprising more than 40,000 specimens, referable to about 190 species, were at his disposal, the bulk of these having been collected by the *Albatross* during various cruises to and from Alaska, Bering Sea, and Japan. Out of 189 species, no fewer than 112 are from south Japanese waters, to which most of them are restricted. This Honshu fauna, as it is called by the author, is evidently related to the still richer Oriental ophiurid fauna, although only about a dozen species are at present common to the two. The Bering Sea fauna is very distinct from that of Honshu, although the two are connected by a group of sixteen common species. Other points brought out in the monograph are the occurrence of West Indian species in the North Pacific, and evidence in favour of the existence of a distinct circumpolar fauna.

A VALUABLE paper on the post-larval development and minute anatomy in the genera Scalpellum and Ibla has been lately published by Dr. F. H. Stewart in the Memoirs of the Indian Museum (vol. iii., No. 2, 1911). The author has been able to supplement, in some important particulars, the accounts of cirripede development as given in Darwin's classical Ray Society Monograph and in Hoek's well-known contribution to the *Challenger* Reports. There are four plates of excellent drawings representing stages between the cyprid-larva and the adult, mostly taken from species of Scalpellum. It will be remembered by students of the barnacles that while Darwin and Hoek had stated the dwarf male forms of Scalpellum and Ibla to be sexually pure, Gruvel at a later date (1899) claimed to detect rudimentary ovaries in the peduncle of the male *Scalpellum peronii*. Dr. Stewart fails to find in *S. squamuliferum*, and also in a specimen of *S. peronii* itself, any cells that can be regarded as ova, and his descriptions suggest the probability of Gruvel's "cellules ovariennes non développées" being, in truth, large cement-gland cells. Dr. Stewart has also established the absence of any trace of a testis in the female *Ibla cumingii*. His work therefore confirms Darwin's distinction of truly unisexual forms, hermaphrodite forms, and pure dwarf-males among the barnacles.

A LENGTHY paper in Russian by Mr. S. Kostytschew, dealing with respiration phenomena in plants, is published in the botanical section (No. 1) of "Travaux de la Société Impériale des naturalistes de St. Pétersbourg" (vol. xlii.). From his experiments and conclusions derived therefrom

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the author constructs the following theory :—There are two distinct processes to be considered in respiration. On one hand, there is absorption of oxygen leading to the formation of certain oxidising substances, notably peroxides, and on the other, decomposition of sugar by a ferment. The immediate products of fermentation may give rise to alcohol, or, under the action of peroxides, may be fully oxidised to carbon dioxide and water.

THE administration report for 1909 of the Ceylon Botanic Garden, prepared by the acting director, Mr. R. H. Lock, together with the supplemental report by other officers, has recently come to hand. Reference is made to the importation of agricultural machinery and tools, not only for planters' estates, but also for the rice lands cultivated by natives. The shot-hole borer, *Xyleborus fornicatus*, a pest on tea bushes, has engaged the attention of the entomologist, Mr. E. E. Green. The historic scourge of the coffee plant, the green bug, *Lecanium viride*, was reported from one district as another pest on tea, and a slug, *Mariaella dussumieri*, was notified as a destructive feeder on young rubber plants. The curator records the first flowering of the apocynaceous shrub *Stemmadenia bella*, and the planting of an avenue of the beautiful pink-flowered variety of *Lagerstroemia Flos-reginae*.

AN important and very useful contribution to hepaticology is provided by Mr. S. M. Macvicar in an enumeration and account of the distribution of liverworts in Scotland, which has been published as the twentieth volume of the Transactions and Records of the Botanical Society of Edinburgh. The compilation of localities and collectors for each species is in itself a formidable task, even when assisted by the cooperation of correspondents. In addition, the author has added to the Scotch records many more new species than any other collector; *Aneura incurvata*, *Adelanthus decipiens*, *Acrobollus wilsonii*, and *Calypogeia succica* are four out of several species found as yet by Mr. Macvicar alone. The floristic sketch of the seven botanical provinces contains many interesting details. Considered from an ecological point of view, hepatici become dominant on some of the higher mountain tops, where a Marsupella-Gynomitrium association is often developed. The coterie of Atlantic species is the most important and remarkable, as some of them would be classed as subtropical and do not occur otherwise in Europe.

A PAPER on fungous root tubercles, communicated by Mr. E. G. Arzberger to the twenty-first report of the Missouri Botanic Garden, deals with conditions examined in *Ceanothus americanus*, *Elaeagnus argentea*, and *Myrica cerifera*; at the same time it is stated that apparently all species of Ceanothus and Myrica possess them to some extent. The course of events was found to be very similar for Ceanothus and Elæagnus. The fungus enters a young root, and in consequence a tubercle is formed; hypertrophy leads to the development of a large cortex in which the fungal mycelium ramifies; the nuclei of the invaded cortical cells increase abnormally; then the fungus forms vesicles, regarded by the author as sporangia, and absorbs nucleus and cytoplasm of the host cell; subsequently the fungal cells disappear. In the case of Myrica there is no tendency to break up the contents of the vesicular structures, and the form of the fungus indicates that it belongs to the genus Actinomyces.

BESIDES the vast store of archæological information which Dr. M. Aurel Stein brought back from Chinese Turkestan and Western Kansu, he and his assistants from the Survey of India carried out a very large amount of careful topographical surveying, which very greatly improves the maps of that region. Plane-table surveys were carried on continuously during the journeys, and these were controlled by astronomical observations for latitude made at seventy-two stations, and by others made during a previous journey in 1900–1. From this material ninety-four sheets are being prepared by the Survey of India on the scale of 1 : 253,440, and will be published in the form of an atlas to accompany the detailed report on the scientific results of Dr. Stein's last journey. In the meantime reduced copies have been published by the Royal Geographical Society in the Journal for March. The whole area from Kashgar to Kan-Chou (long. 75°–101°), including the Takla Makan desert and the mountains bounding it, is plotted on the scale of 1 : 3,000,000. Other maps on the scale of 1 : 1,000,000 show the Kun-Lun range on the frontier of Kashmir, and Western and Central Nan-Shan to the eastward. On all these maps, heights which have been determined by triangulation, or by barometric or clinometric observations, are shown, names have been carefully revised, and the areas occupied by cultivation, scrub or jungle, and desert have been distinguished. The whole forms a most valuable addition to Asiatic cartography.

THE monthly meteorological charts for May issued by the U.S. Weather Bureau for the oceans and for the Great Lakes of North America have been received. Among the various data, in addition to the usual mean values, we may mention an article (on the back of the charts) entitled "Weather Lore of the Sea," which includes a large collection of proverbs. These are not given as unfailing signs of coming weather; in fact, it is pointed out that for some, depending on celestial bodies, such as moon and stars, careful records fail to show the slightest influence, but the mariner may find it interesting to verify others at his convenience. The Deutsche Seewarte also makes good use of the space available at the back of such charts. The North Atlantic chart for April contains a detailed account of the quick voyage of the sailing ship *Potosi* to the west coast of South America and back, together with useful remarks as to the course and the advantage taken of actual and average weather conditions.

WHILE the reports published in NATURE furnish an indication of the papers read before the London Mathematical Society, considerable interest attaches to the annual volume in which these papers are published, as affording a survey of the year's work. The Proceedings of the London Mathematical Society for 1910 (London, Francis Hodgson, 1910) shows the same high standard that has been maintained in previous years, and contains thirty papers, notable among which are five important contributions to analysis by Dr. W. H. Young, F.R.S., and papers by Bateman, Hardy, Dixon, Hobson, Lamb, Watson, and others, altogether twenty mathematicians having contributed to the present volume. In applied mathematics we have papers on electrodynamical questions by Bateman, Cunningham, Hassé, and Larmor, on heat by Carslaw, on diffraction by Lamb, and on attractions by Leathem. The importance of maintaining and further stimulating interest in these proceedings will be evident when we compare the output of English mathematical original work with what is being accomplished elsewhere, particularly in America. We have, in addition to the present "Proceedings," our "Quarterly" and our "Messenger," but if a quantitative test is of any value, the American Society's Bulletin and Transactions,

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the American Journal and the Annals certainly have the lead. As regards quality, a comparison is not so easily made. In America groups are now receiving most attention; in the present volume analysis largely preponderates.

ACCORDING to a copy of a paper in the Bulletin of the Academy of Sciences of Cracow which has reached us, M. H. Merczyng has succeeded in measuring the refractive indices of water and alcohol for electrical waves of 4·5 and 3·5 centimetres, produced by means of a Righi oscillator working in petroleum. The rays sent out by the oscillator are rendered parallel by passing through a spherical flask filled with petroleum, and then fall at an angle of about 40° on the surface of the liquid. The reflected beam is received by a parabolic mirror, which concentrates it on to a thermo-junction. From the angle of incidence and the ratio of the intensities of the reflected and incident beams, the refractive index of the liquid is calculated. The wave lengths are measured by the Fresnel double mirror method. The results obtained, when compared with the known results for longer waves, show that in both cases the region in the neighbourhood of 4 centimetres is one of anomalous dispersion, the refractive indices increasing as the wave-length increases.

MESSRS. E. R. NORMAN AND CO., 26 Great George Street, Leeds, have issued a pamphlet describing the Sytam system of making notes and filing papers. The system consists of methods of binding together loose sheets of paper which can be readily introduced or removed or changed in position, forming a compact book. There are four different kinds of mechanism suitable for binding together sheets of various sizes, which range from $3\times2\frac{1}{8}$ to $13\frac{1}{2}\times9\frac{1}{2}$ inches. The system appears to be quite practical and easy of application; we have seen a large ledger in which sheets are arranged for the D schedule (chemistry) of the International Catalogue, the names of the sections of the schedule being indicated by projecting tabs on the edges of the sheets, which renders reference very easy.

"REMARKABLE ECLIPSES" and "Remarkable Comets," both by Mr. W. T. Lynn, have just been issued in their eleventh and fifteenth editions, respectively, by Messrs. Samuel Bagster and Sons, Ltd. Both have been brought right up to date, and the most remarkable feature of each is the enormous amount of information compressed within so small a compass and sold at the low price of 6*d.* each net. The former volume includes notes on the most remarkable eclipses of the sun since 1063 B.C., and of the moon since 721 B.C., while the second briefly describes all the remarkable comets of which history speaks, even though it be with far-off whispers. An excellent drawing of Halley's comet, as seen by Miss E. M. Phillips at Barbados on May 17, 1910, is an additional feature, new in this edition.

THE April issue of Mr. C. Baker's quarterly classified list of second-hand instruments contains a description of more than 1500 pieces of scientific apparatus for sale or hire at Mr. Baker's second-hand department, 244 High Holborn, London.

IN Mr. E. P. Stebbing's paper on "Tree Planting in Towns," on p. 197, col. 1, of NATURE of April 6, the word "Etna" should have been "Everest." Mr. Stebbing asks us to correct this error, which was made by his typist, and was overlooked by him in the proof of the paper submitted to him.

OUR ASTRONOMICAL COLUMN.

APRIL METEORS.—Mr. W. F. Denning writes:—"The April meteoric shower will occur this year when there will be little moonlight. With clear skies it ought to be very satisfactorily observed, but the character of its return cannot be predicted.

"On April 19, 1803, there was a fine display, but it has not returned in the same abundance during the 108 years which have elapsed since the date alluded to. There is no reason to anticipate a brilliant exhibition this year, but the sky should be vigilantly watched on the nights of April 20, 21, and 22, so that if the shower actively returns it may be suitably recorded. It is often of short duration, and true Lyrids are rarely, if ever, observed before April 17 or after April 24.

"From observations made at Bristol since 1873, I certainly believe that the radiant point is liable to the same easterly motion as that which affects the emanating centre of the Perseids. But the April stream supplies so few meteors, except on the date of maximum, that it is extremely difficult to get the precise position of the radiant point on the 17th and 18th, and 23rd and 24th. Observers would do well to gather as many apparent paths as possible on the nights just named. Records of meteors obtained at two stations would be specially valuable as serving to indicate the point of radiation accurately. On April 18, 1901, 13h. 19m., a bright Lyrid was recorded by Prof. Herschel at Slough, and by the writer at Bristol, and the radiant was indicated at 266°+33°. This object afforded evidence that the Lyrid focus is a changeable one, for its centre is at 270°+32° on April 20. Additional observations of similar character would supply valuable details bearing on an interesting feature of the display."

THE SPECTRUM OF NOVA LACERTÆ.—Spectrograms of Nova Lacertæ were secured at the Potsdam Observatory on January 6, 7, 8, and 23, and are described by Prof. Münch in No. 4490 of the *Astronomische Nachrichten*. The wave-lengths were determined by taking the mean measured wave-lengths of the hydrogen lines as normal, and then interpolating the other measures. Naturally, no rigid accuracy is claimed for the values as being absolute, but the table is a useful record of the lines seen and of their various intensities and characters. On January 7 Hγ and Hδ were sharply defined on the red side, but diffuse on their more refrangible edges, where they were accompanied by broad absorption bands: the maximum intensity lay on the red side of each line; on the other hand, Hε and Hζ were equally sharp on both sides. The usual decrease in the intensity of the continuous spectrum took place, and on January 23 it was much fainter than on January 7. Prof. Münch discusses the intensity curve of the nova spectrum, and by a comparison of the distribution of energy therein shown with that given by several stars of the A type, he derives an energy curve for the nova.

THE DIFFERENT QUALITY OF THE LIGHT REFLECTED FROM VARIOUS PARTS OF THE LUNAR SURFACE.—It will be remembered that Prof. R. W. Wood found recently that, when photographed in ultra-violet light, various features on the moon presented different appearances from those presented on ordinary photographs.

Working at the Charlottenburg Technischen Hochschule, Herren A. Miethe and B. Seegert have carried the investigation a step further by using two screens in connection with a reflector, one of which transmitted light of wave-lengths 360–330 $\mu\mu$, the other light of wave-lengths 700–600 $\mu\mu$. A comparison of the plates so obtained shows remarkable differences of illumination, especially on some of the surfaces of the *maria*. The higher parts of the lunar surface, especially in the region of the south pole and about the ring mountains of Copernicus, reflect hardly any ultra-violet light, while the north polar regions reflect a great deal. By projecting the two photographs through complementary screens, the differentiation of colour is brought out remarkably, the Sinus Roris and Mare Nubium showing remarkable variations (*Astronomische Nachrichten*, No. 4489).

THE PYRHELIOMETRIC SCALE.—A paper with important bearing on the question of the value of the solar constant is published by Messrs. Abbot and Aldrich in No. 3, vol.

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