star in the Pleiades, were obtained in December, 1912, with a slit spectrograph attached to the Lowell 24-in. refractor. The two plates were exposed five and twenty-one hours respectively. They agree in showing a continuous spectrum crossed by the dark lines of hydrogen and helium, the spectrum of the nebula being a true copy of that of the brighter stars of the Pleiades. The light of the nebula is thus shown to be of stellar origin. As it seems improbable that a mass of stars, all of the same spectral type as the Pleiades, should so group themselves behind the Pleiades as to give the appearance of a nebula, the author believes it more probable that the nebula consists of diffused material surrounding the stars and shining by reflected starlight. This is the first successful observation ever published upon the spectrum of this faint nebula.

A symposium on wireless telegraphy and telephony was an important part of the meeting. Among the papers read was one on radiated and received energy, by Dr. Lewis W. Austin, head of the U.S. Naval Radio-Telegraph Laboratory. Mathematical theory indicates that the energy radiated from a radio-telegraphic antenna will produce an electromotive force on a receiving antenna proportional to the current in the sending antenna, to the height of the sending antenna, to the height of the receiving antenna, inversely proportional to the wave-length, and inversely proportional to the distance between the two antennas. Since the loudness of signal is proportional to the square of the current in the receiving antenna, the signal falls off as the square of the distance between the two. This law has been verified by the experiments made by the United States Navy Department between the new high-power station at Arlington and several other stations situated in and near Washington. Observations at distances above 100 miles show that in addition to the diminution in intensity of signal with the distance, there is in an absorption either in the atmosphere or ground, such that at a distance of 1000 miles over salt water, with a wave-length of 1000 meters, the received current is only approximately 1/25; that is, the received signals are reduced to 1/600 of what they would have been had there been no absorption. The absorption decreases as the wave-length is increased, so that for communication over great distances, long waves 4000 to 7000 metres in length are used, while for short distances of a few hundred miles short waves are better, since they are radiated more energetically. These facts apply to daylight communication only, which is in general regular, night ranges, though greater than day, being freakish and uncertain. The absorption over land is much greater than over water, especially for the shorter wave-lengths. In recent tests between the Arlington station and the scout cruiser *Salem*, on its voyage to Gibraltar and return, messages were received from Arlington in the day-time on the *Salem* up to a distance of 2100 nautical miles, and at night as far as Gibraltar. A comparison was also made of the action of two types of sending sets, one being the regular spark-sending set and the other a set in which the waves are produced from an electric arc. It has been claimed that the continuous waves emitted by the arc are less absorbed than the broken-up trains of waves produced by the spark. Up to 1000 miles no difference in the absorption was observed, but at 2000 miles the observations indicated that the received arc energy was relatively four times greater than that of the spark.

During the meeting Sir A. J. Evans, Sir Joseph Larmor, and Dr. Schuster were elected foreign members of the society.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

BIRMINGHAM.—Prof. W. S. Boulton, professor of geology at University College, Cardiff, has been appointed to succeed Prof. C. Lapworth, F.R.S., who is retiring at the close of the present session. Before his appointment to University College, Cardiff, Prof. Boulton had been assistant lecturer in geology at Mason College, under Prof. Lapworth.

Dr. O. J. Kauffmann has been appointed successor to Prof. A. Carter, as joint professor of medicine, and the chair of surgery, vacated by Prof. G. Barling, on his election as Vice-Chancellor, has been filled by the election of Mr. W. P. Haslam.

Dr. T. Stacey Wilson has been invited to deliver the Ingleby Lectures for 1914.

Dr. P. T. Hughes is to represent the University at the International Congress of Neurology and Psychiatry at Ghent.

LEEDS.—At the request of the Development Commissioners, the University has undertaken the preliminary arrangements for an investigation in flax growing and in the methods of retting which would be suitable for a central rettery. Selby has been chosen as the chief place of experiment, and 120 acres of land have been sown with various selected types of seed. Negotiations are in progress for the establishment of a central rettery where the whole crop may be treated. The Treasury has sanctioned a grant from the Development Fund to cover the cost of the preliminary steps. The question of the subsequent control and direction of the experimental station is still being considered by the Development Commissioners.

OXFORD.—The annual report of the delegates of the Oxford Museum, which was presented to Convocation on June 10, is a lengthy document occupying thirty-two pages of the *University Gazette*. It includes separate reports of the museum departments, prepared by the regius professor of medicine, the professors of pathology, physiology, human anatomy, comparative anatomy, zoology, experimental philosophy, physics, engineering science, chemistry, geology, rural economy, and mineralogy, by the curator of the Pitt-Rivers Museum, and the reader in pharmacology. The introductory matter records the resignation of Prof. Odling, and the election of Prof. Perkin to the vacant chair of chemistry, together with the appointment of Mr. J. A. Gunn to the newly established readership in pharmacology. The reports of the several professors give evidence of much activity in both teaching and research; in most cases they include lists of important additions to the collections of specimens and the stock of apparatus. The longest and most elaborate contribution is that of the Hope professor of zoology (Prof. Poulton), whose account of the work of his department takes up more than half of the whole publication. The events of which he makes special mention are the taking over by his department of the lower portion of the south room of the old Radcliffe Library, and the meeting of the International Congress of Entomologists at Oxford last August. Attention is directed to many valuable additions to the collection, and particularly to the African insects presented by Messrs. K. St. A. Rogers, W. A. Lamborn, J. A. de Gaye, and Dr. G. D. Carpenter. An interesting list of accessions to the Pitt-Rivers collection is given by the curator (Mr. H. Balfour), who makes special mention of stone implements collected in Ashanti by Mr. R. S. Rattray, a former diploma student in the department. Space will

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not allow mention of the other reports, all of which contain matter of interest.

DR. T. K. MONRO has been appointed professor of practice of medicine in the University of Glasgow, in succession to the late Prof. S. Gemmell.

MR. P. F. KENDALL, junior assistant curator of the zoological museum of the University of Sheffield, has been appointed lecturer in zoology and geology in the South-Eastern Agricultural College at Wye.

THE widow of the late Dr. Hervieux, who died six years ago, has given 4000*l.* to found two bursaries for poor students. We learn from the *Revue Scientifique* that Mme. Hervieux has also bequeathed to the Paris Academy of Medicine a bust of her late husband.

UNDER the auspices of the Edinburgh Mathematical Society, a mathematical colloquium will be held in Edinburgh during the week beginning Monday, August 4, and lasting five days. The following courses of lectures have been arranged:—"The Theory of Relativity and the New Physical Ideas of Space and Time," Prof. A. W. Conway; "Non-Euclidean Geometry and the Foundations of Geometry," Dr. D. M. Y. Sommerville; "Practical Harmonic Analysis and Periodogram Analysis: an Illustration of Mathematical Laboratory Practice," Prof. E. T. Whittaker, F.R.S. Further particulars may be obtained from the honorary secretary of the Edinburgh Mathematical Society, 19 Craighouse Terrace, Edinburgh.

THE prospect of early educational legislation has led lately to much discussion and to many speeches by prominent persons on various aspects of the problem of providing an adequate and properly organised system of education. Opening the new buildings on June 6 of the Newcomen's Foundation Domestic Trade School for Girls in London, the President of the Board of Education, Mr. Pease, said that when the history of the past fifty years comes to be written it will show that there has been too great an effort to make individuals read books. The result has been that people too often take their opinions from books, instead of forming them for themselves as the result of their own experience, their own thought, and their own work.—On June 6 and 7 the annual meeting of the Association of Education Committees was held, and resolutions were passed (*a*) declaring that it is imperative that a revision of the incidence of the cost of education as between the national and the local contributions shall precede any further legislation or administrative action which will increase the cost of education; (*b*) expressing the opinion that a new form of State contribution should be substituted for the very unsatisfactory system of grants to local education authorities, and that the Exchequer grants should increase automatically as new and increased responsibilities were put upon local education authorities; (*c*) expressing the opinion that the time has arrived when the strongest possible protest should be offered to local authorities undertaking any further financial obligations until the Government has redeemed its promise of further financial aid. Mr. Pease, who attended the meeting, said it is realised that more money ought to be given by the State in support of education, and that education committees should cooperate one with another with the view of coordinating the whole system of education in the country and making it more perfect.

COMMEMORATION Day at Livingstone College, Leyton, was held on June 7, and formed the centenary celebration of David Livingstone's birth. After a preliminary statement by the principal (Dr. C. T. Harford), the chairman (Bishop Montgomery) addressed the meeting. He emphasised the importance of medical training for missionaries, especially for those who had to go to tropical countries. Sir A. Pearce Gould said that the life of Livingstone was an outstanding contradiction to and repudiation of materialism. He spoke of the value of the college training for all missionary students, and urged the advantage of the course for missionaries on furlough, who would thus be brought into touch with recent medical researches. He referred to Livingstone's skill as a physician, and to his anticipations of modern research. Livingstone clearly saw the close connection between mosquitoes and malaria, and that there was an absence of malaria in the highlands where there were no mosquitoes, but in the lowlands where they swarmed malaria was prevalent. Livingstone recognised that the bite poisoned the blood, and noted that "the germ which enters when the proboscis is inserted to draw blood, the poison germ, is capable of reproducing itself." Livingstone also saw clearly the high importance of quinine in cases of fever. The Rev. W. D. Armstrong, who had been fifteen years on the Congo, spoke of the extreme value of his medical training in the maintenance of his own health whilst he was sampling Congo diseases, and in the valuable work he was able to do for his wife and fellow-missionaries at critical times. He spoke of the frequent call for help from traders, who were often entirely dependent on the missionary for medical help. This relationship had been an efficient means of establishing good relations between traders and missionaries in the troublous times of the rubber controversy. At the conclusion of the meeting the visitors had opportunities of examining the college laboratory for research in tropical diseases and the Livingstone relics which were on exhibition.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, June 5.—Sir Archibald Geikie, K.C.B., president, in the chair.—Dr. R. **Broom**: The origin of mammals (Croonian Lecture). An endeavour is made to trace the evolution of mammals from Cotylosaurian ancestors through the carnivorous Therapsida.—Dr. E. A. Newell **Arber**: The fossil floras of the Wyre Forest, with special reference to the geology of the coalfield and its relationships to the neighbouring Coal Measure areas.

Zoological Society, May 20.—Prof. E. A. Minchin, F.R.S., vice-president, in the chair.—Dr. R. **Broom**: The South African pseudosuchian reptile Euparkeria and allied genera. Besides giving an account of the very completely known South African form, the author also discussed the structure of the Elgin allied forms, Ornithosuchus and others. The group of pseudosuchians he regarded as an extremely important primitive reptilian order, as there is good reason to believe that not only does it contain the ancestor of the dinosaurs, but also the ancestors of the pterodactyles and birds. Euparkeria and Ornithosuchus are, in structure, almost dinosaurs, and it is held that when the bipedal habit was more fully acquired the few characters not quite dinosaurian would become dinosaurian. Birds are held to have originated from a pseudosuchian which, by a bipedal habit, had acquired a dinosaur-like hind limb, and had then become arboreal in habit and acquired the peculiar power of flight.—E. G. **Boulenger**: Experiments on the metamorphosis of the Mexican axolotl (*Amblystoma tigrinum*). A detailed description was given of the changes that take place in the course of transformation. The author also exhibited a number of specimens in the perfect or amblystome condition. The conclusions arrived at, as a result of

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