establishment of a system of main transmission lines called the 'Grid Iron' for the purpose of interconnecting the principal generating stations of Great Britain, and in due course proposed the shutting down of less efficient stations. To effect this, a new organisation called the Central Electricity Board was set up to manage what may be called the 'wholesale' side of the supply industry. This Board is now hard at work accelerating the completion of the 4000 miles of transmission line and the numerous transforming and switching stations involved, and is already well ahead of its original programme.

Although on technical and financial grounds it was advisable to use overhead lines, it was necessary to use a considerable mileage of cable, mainly in the London district. The value of the orders given by the Board to British firms now exceeds 22 million pounds. This has reacted on unemployment figures and the electrical industry is one of the few flourishing industries in the country. The Board is in no sense a government department. It is part of the supply industry and is financially self-supporting.

Great Britain with its dense population, diversified industries, cheap coal, and extensive coast-line is an ideal country to electrify. What is needed is an efficient organisation to ensure that expansion of output which will bring cheap electricity to the consumer. The field is wide. Only about 65 per cent of the machinery utilised in industry is electrically driven. There are eleven million potential consumers in Great Britain and only about four and a quarter million are connected with the supply mains.

Sir Archibald Page pointed out that Great Britain was the first country to lay down a national system of electric trunk mains. It was now almost impossible to make a train or car journey of any distance without seeing some of the lattice steel towers supporting the electrical conductors which constitute the 'grid'.

University and Educational Intelligence

CAMBRIDGE.—At Emmanuel College the studentship offered for competition to graduates of other universities intending to commence residence as research students in October has been awarded to L. Belchetz, Rhodes University College, Grahamstown, South Africa (chemistry). The studentship held by J. W. Harding (Victoria University College, Wellington, New Zealand) for mathematical physics has been renewed for a third year. Internal studentships offered for competition to members of the college have been awarded as follows: B. V. Bowden (physics) for one year, A. J. Ward (mathematics) for two years.

LONDON.—The following degrees have been conferred: D.Sc. in biochemistry on Manayath Damodaran (Imperial College—Royal College of Science) for a thesis on "The Amino-Acids of Gluterin" (*Biochem. J.*, 1931), "The Dicarboxylic Acid Nitrogen of Proteins" (*Biochem. J.*, 1931), and "The Isolation of Asparagine from an Enzyme Digest of Edestin" (*Biochem. J.*, 1932). D.Sc. in chemistry on Ranchhodji Dajibhai Desai (Imperial College—Royal College of Science) for a thesis entitled "The Influence of Methylcyclopentane and Methylcyclohexane Rings on Carbon Tetrahedral Angle" (*J. Chem. Soc.*, May 1931 and April 1932). D.Sc. in mining geology on Mr. G. C. A. Jackson (Imperial College—Royal School of Mines) for a thesis entitled "The Geology and Ore-deposits of the N'Changa Mine and District, Northern Rhodesia", a portion of which, entitled "The Ores of the N'Changa Mine and Extensions, Northern Rhodesia", has been published in *Economic Geology*, vol. 27, No. 3, 1932. D.Sc. in psychology on Mr. S. J. F. Philpott (University College) for a thesis entitled "Fluctuations in Human Output" (*Brit. J. Psych.*, 1932).

IT is announced that the Prudential Assurance Company has offered to contribute £1500 a year for a term of seven years to the London School of Hygiene and Tropical Medicine. The suggestion that the contribution shall be directly associated for the duration of the gift with the University chair of public health has been accepted by the governors of the School.

THE Science Scholarships Committee of the Royal Commission for the Exhibition of 1851 has made the following appointments to Overseas Scholarships for 1932:—On the recommendation of McGill University: Mr. J. F. Heard (physics, Imperial College of Science and Technology, London), Mr. M. K. McPhail (biochemistry, National Institute for Medical Research, London); on the recommendation of Queen's University, Kingston: Mr. W. J. Henderson (physics, University of Cambridge), Mr. G. S. Farnham (metallurgy, University of Manchester); on the recommendation of the University of Melbourne: Mr. A. B. Edwards (geology, Imperial College of Science and Technology, London); on the recommendation of the University of Sydney: Thelma M. Reynolds (organic chemistry, University of Oxford); on the recommendation of the Universities of Cape Town and the Witwatersrand: Dr. E. C. Halliday (physics, University of Cambridge and the Experimental Station of the Radio Research Board, Slough); on the recommendation of the University of New Zealand: Mr. R. M. Barrer (physical chemistry, University of Cambridge).

Calendar of Geographical Exploration

Aug. 10, 1537.—De Vaca and the Gulf of Mexico

In 1528, Cabez de Vaca had accompanied Pamfilo de Navarez on an expedition which landed on the west coast of Florida near Tampa Bay. In a subsequent march they lost touch with their ships and the party broke up. In the winter of 1528–29, of a party of 80 on the 'Island of Misfortune' off the coast of Texas, only 15 survived. De Vaca was one; he crossed to the mainland and spent five years among the natives. Then, with a companion, he travelled south, crossing the Brazos and Colorado Rivers and reaching San Antonio Bay. Ultimately he reached Mexico City and returned to Europe, arriving at Lisbon on Aug. 10, 1537. His account of the riches of the region which he had visited resulted in the journeys of Coronado and de Soto.

Aug. 11, 1901.—Kaiser Wilhelm II. Land

Prof. von Drygalski left Kiel on Aug. 11 in the *Gauss*, reaching Kerguelen Island on Dec. 31, where a party of German scientific workers had landed a few months earlier and had set up an observatory. The *Gauss* wintered in the ice, and a sledging party discovered the land named Kaiser Wilhelm II. Land, with a hill 1500 ft. high, which was named the Gaussberg. The expedition not only discovered new land, but also recorded many valuable scientific observations.

Aug. 12, 1767.—Carteret's Discoveries in the Pacific

Capt. Carteret in the *Swallow*, after discovering Pitcairn Island, reached the Santa Cruz group. Although these islands had been discovered by Mendaña a century before, their position was but imperfectly known and Carteret may be credited with their rediscovery. Later the group now known as the Carteret

Islands was discovered, though Carteret himself identified them wrongly. Carteret's most important discovery was that the strait between New Britain and New Ireland was a channel and not a bay, as Dampier had concluded. Other small islands were discovered and the south coast of Mindanao was examined, the *Swallow* returning home in 1769.

Aug. 13, 1829.—The North Magnetic Pole

Sir John Ross in the *Victory*, accompanied by his nephew, James Clark Ross, in a ship fitted up by Sir Felix Booth, reached Fury Beach, where Parry had abandoned the *Fury* in 1825. Their object was to find the north-west passage. In this they failed, but the land called Boothia in honour of Sir Felix Booth was discovered, and James Clark Ross, by means of sledge journeys, located the north magnetic pole in 70° 5′ 17″ N., 95° 46′ 53″ W., on the western coast of Boothia. He also discovered and named King William Land and surveyed its northern shore. Their boat was frozen in during its first winter and the Rosses were unable to extricate it. They thus spent four winters in the region, when fortunately they were picked up by a whaling vessel in Lancaster Sound, which they had reached by boat. This whaler, the *Isabella*, was the same ship in which J. C. Ross made his first voyage to the arctic regions in 1818. J. C. Ross in 1839–43 did magnificent work in the antarctic. (See Calendar for Jan. 1.)

Societies and Academies.

DUBLIN

Royal Dublin Society, May 24.—Irish Radium Committee Report for the year 1931. 16,756 millicuries of radon were issued during the year for therapeutic purposes. Detailed reports from some of the largest users record the results of the treatment of 400 cases.—**J. Stuart Thomson**: The anatomy of the tortoise. A study of the morphology of the closely allied species, *Testudo ibera* and *T. græca*, system by system, in a way never attempted in a chelonian since the classic work of Bojanus on *Emys europæ* in 1819. The dissections of the vascular system from injected specimens, showing the complicated connexions of the arteries and veins related to the carapace, are some of the important features. Transverse sections of a six-weeks-old *Testudo* cut in celloidin are figured. The author recommends the importance of some dissections from the dorsal surface, after dissolving away the carapace with acid.—**W. E. Abraham**: Contact angles in an oil-water interface and their application to free flotation in the Weva inclinometer. In this instrument a floating magnet is used to determine the magnetic meridian. The magnet is encased in ebonite coated with gutta-percha, which lies in an oil-water surface in a containing glass vessel. As the water does not wet the gutta-percha, capillary repulsion ensures free rotation.—**J. Lyons** and **G. T. Pyne**: Factors affecting the body or viscosity of cream and relative matters. Data are presented to show the effect of separation temperature, previous chilling, and pasteurisation of milk, and re-separation of chilled pasteurised cream on the viscosity of the ultimate product.

EDINBURGH

Royal Society, June 20.—**Pierre Rijlant**: Automatism and conduction in the mammalian heart. The contraction of the heart starts in the sinus region. This initial activity is accompanied by mechanical and electrical changes limited to the sinus. The cathode ray oscillographic records of the pacemaker's activity show a series of electric waves, each of them being localised to a limited region of the sinus. The initial wave appears in a limited spot situated at the venous side of the sinus and corresponding to the embryological remnant of the right duct of Cuvier. The transmission of this initial activity to the auricle occurs through a differentiated contractile conduction system. In the mammalian heart automatism and rhythmicity occur in a limited region with characteristic structure. These regions are contractile and their contraction is independent from that of the myocardium. Transmission occurs through a differentiated system which unites the different segments of the myocardium.—**L. Hogben**: Filial and fraternal correlations in sex-linked inheritance. When inheritance is sex-linked, the correlations of relatives differ from those based on the more typical mode of transmission, and differ according to the sex of the pairs. As compared with filial correlations of the Pearsonian type, the correlation for father and son is zero, for mother-daughter it remains unchanged, and for father-daughter or mother-son it is raised. The correlation for brother-sister is lowered as compared with Pearson's fraternal coefficient. For brother-brother it remains unchanged and for sister-sister it is raised. From the formulæ given it is seen that no comparison between twin correlation is valid unless the sex composition of the groups compared is identical. In addition, it is seen that a study of correlation between relatives classified in every possible way with respect to sex could provide a means of estimating the contribution of sex-linked genes to the observed variants in a population.—**A. Graham**: On the structure and function of the alimentary canal of the limpet. In *Patella vulgata* the radula, lubricated by the salivary secretion, scrapes the food particles, mainly diatoms and small algæ, off the rocks on which the animal is living, and conveys them to a ciliated food channel running down the fore-gut. Into this channel ciliary currents convey an amylolytic enzyme secreted by side folds in the same region. The mixture of food and enzyme is absorbed by absorbing cells in the digestive gland. The rest of the alimentary canal, of which five histologically different portions may be distinguished, is chiefly concerned with elaborating the waste matter into rod-shaped fæcal masses.—**S. M. K. Henderson**: Notes on Lower Old Red Sandstone plants from Callander, Perthshire. South of Callander, plant-bearing flagstones occupy the centre of a great syncline, and are exposed in the area between the Rivers Teith and Forth. The following have been obtained from an exposure in the Tarr Burn at Ballanucater Farm: (1) *Pachytheca* sp.; (2) *Arthrostigma gracile*, Dawson; (3) *Psilophyton*, Dawson, and associated remains that may belong to the one plant. Those included under (3) may be grouped into (*a*) spiny stems, (*b*) slender spineless dichotomous branch-systems, (*c*) stout and slender branch-systems with axillary structures. The consideration of these remains has raised two questions: Does the association of plants of type (*b*) with those of type (*a*) indicate the appearance of *Hostimella*-like plants in the Lower Old Red Sandstone, or may they be classed under some such form as *Psilophyton goldschmidti*? The second question concerns the demonstration of axillary structures in some of the branch-systems (*c*). Do they belong to spiny axes of *Psilophyton* type, or do they indicate the presence of another type that would have to be classed as *Hostimella* sp.?

PARIS

Academy of Sciences, June 20 (vol. 194, pp. 2181-2248).—**H. Douville**: Notice on the work of Albert de Grossouvre.—**C. Matignon** and **M. Léon**: The thermo-