

means of an electric circuit. The high frequency voltage is then cut out and a fifty cycle voltage applied, and the electric circuit is adjusted until the balance is the same as before. In this way the effective value of the high frequency voltage can be found. The comparisons are made rapidly, so that the temperature of the Kerr cell remains practically constant and the necessity of applying a temperature correction is eliminated. So long as the colour of the light is the same when making the two comparisons, it is not necessary to know its wave-length.

According to results obtained by physicists, it can be assumed that up to frequencies of thirty million cycles per second the Kerr effect is free from inertia.

In this case the wave-length is ten metres. The authors suggest that it can probably be used down to five metre wave-lengths. They have used the method for voltages lying between 300 and 4000 volts. The highest frequency they used was twelve million cycles (25 metres). By using a Pulfrich photometer and applying a direct method they found that the error was 1 per cent when the applied voltage was 800 and 0.33 per cent at 1800 volts. With the photoelectric method the error was 2 per cent at 800 volts and 0.1 per cent at 1800 volts. This method has the disadvantage that the photoelectric cells and the amplifying apparatus have to be carefully screened.

Annual Conference of the Geographical Association.

THE Annual Conference of the Geographical Association was held at the London School of Economics, by kind permission of the director, Sir William Beveridge, on Jan. 6-8. As usual, the Conference was well attended by delegates and members from all parts of Great Britain, and at some of the lectures the audience exceeded four hundred. A representative publishers' exhibition, in which twenty-six firms took part, was held in conjunction with the Conference. At the termination of the proceedings in London, according to established custom, a party of members spent the week-end in a country town, this year at Rochester.

Of outstanding importance was the presidential address by Sir Leslie Mackenzie, entitled "A Health Administrator's Attitude to Geography". The work of the medical profession deals increasingly with the prevention of disease as opposed to the cure of disease, and for the medical officer of health geography must be his guide; for geography is the study of the earth as the environment of man, and Sir Leslie referred to the "flowingly intimate" correlation between health conditions and geography. In Scotland the three million population of the Midland Valley contrasts with the 420,000 people of the Highlands—a reflection of relatively favourable and relatively unfavourable geographical conditions. A study of malnutrition amongst Highland school-children has shown an intimate connexion with bad harvests, which in turn reflect fluctuations in climatic conditions from year to year in a region where other geographical factors such as physiography and soil exercise a somewhat rigid control.

Coming to details, Sir Leslie pointed out that geographers have long emphasised the importance of aspect in influencing the distribution of natural vegetation and crops. It is equally important in determining health conditions. There are valley sides "half starved of sun for a million years" which must inevitably remain disease traps for their human inhabitants when compared with the opposite slopes of the same valleys. Further reference was made to the geographical methods of mapping distributions and of determining limiting factors in each case. There is need for the health administrator to follow these methods. What, for example, is the limit of distribution of tetanus in the soil of France? Is it coextensive with a certain type or certain types of soil? The widespread distribution of tetanus in Flanders soil was one of the great problems which had to be tackled by the medical service during the War. Modern developments, for example, in the field of transport must not be ignored by the medical officer; it has been shown, for example, that disease-bearing mosquitoes can be carried 12,000 miles by aeroplane. In short, the work of the health officer

provides a new *motif* for the study of geography and the employ of cartographical methods of studying distributions.

The work of the Conference included also an important joint discussion with the Historical Association on "What is Historical Geography?" Prof. C. B. Fawcett undoubtedly stated the main difficulty when he said that there are so few equipped with an adequate training in both geography and history, and that until students so equipped are forthcoming the present confusion is likely to continue. He referred to Sir Halford Mackinder as a historian who has become a great geographer, and has expressed the relationship between the two sciences by saying that every event occurs both in space and time and is thus the concern both of geographer and historian, though, of course, not all events are of equal importance to either student.

The discussion made it clear that many of the historians present were inclined to equate 'geography' to 'physical geography' and failed to appreciate the modern human geography. Thus, Dr. J. E. Morris stated: "A geographer can only introduce the subject, for, when he has told us all about climate and situation, environment and stimulus, geological conditions and rainfall, it remains for the historian to show how men have used their opportunities". There was clearly no appreciation of geographical synthesis, of the study of the environment as a living concrete whole, continually acting and reacting on the central figure of man. Similarly, Prof. F. S. Marvin referred to the natural factors, "the river, the mountain, or the sea", and was obviously limiting his conception to the factors of physical geography. On the other hand, Prof. A. P. Newton showed clearly that he represents a school of historians having a clear conception of the methods and value of modern geography. Prof. E. G. R. Taylor showed how a descriptive topographical introduction accompanying historical works has come to receive the label 'historical geography' for what should be merely the geography of history. Indeed, the whole discussion made it clear that both geographers and historians have been guilty of selfishness: geographers using some of the results of historians to further geographical knowledge, historians using fragments of geography here and there for the advancement of historical studies. A plea was made whereby the Geographical and Historical Associations might devise some scheme for the exchange of research data. Miss Jeffries Davis, editor of *History*, surprised many of her listeners by finding a common requirement of both historians and geographers outside the direct sphere of either—the early completion of the 'drift' edition of the geological maps of Britain.

Dr. Gerhard Schott, the well-known oceanographer

of Hamburg, was the Association's principal foreign guest this year, and gave a lecture on the "Humboldt Current in relation to Land and Sea Conditions on the Peruvian Coast". Dr. H. R. Ormsby lectured on the part played by the limestones in the human geography of France, and afforded thereby a delightful example of the broader conceptions which can be drawn from a study of the detail accumulated in her recent book on "France".

At the annual general meeting, Dr. L. Dudley Stamp reported on the progress of the Land Utilisation Survey of Britain, and referred to the urgent necessity of completing the Survey in the present year, so that the record for the whole country would be for 1931-32. He asked especially for volunteers (to communicate with him at the London School of Economics) to complete areas in Oxfordshire, Huntingdon, West Suffolk, Essex, West Sussex, the Isle of Wight, Gloucester, Leicester, and North Yorkshire.

Brigadier H. S. L. Winterbotham gave the Association an account of new developments in the Ordnance Survey one-inch maps. Mr. S. A. S. Hozayen lectured on the Arab geographers, Mr. J. Fairgrieve dealt with several aspects of the cinema in schools, and the Association welcomed an old friend in Prof. P. F. Kendall.

L. DUDLEY STAMP.

University and Educational Intelligence.

CAMBRIDGE.—It is announced that Mr. R. H. Fowler, fellow of Trinity College, and University lecturer in mathematics, has been appointed to the John Humphrey Plummer professorship of mathematical physics. Prof. Fowler is distinguished for his theoretical investigations of the structure of the atom and related subjects.

LEEDS.—The University has received the legacy of £100,000 bequeathed to it for general purposes by the late Lord Brotherton. In conveying thanks to the executors for making the presentation in person and for their expressions of goodwill towards the University, the chairman of the Finance Committee stated that Lord Brotherton, during his lifetime, made gifts to the University amounting to £120,150, chief amongst which were £20,000 for the endowment of the chair of bacteriology and £100,000 for the building of a new library. The erection of the latter—to be known as "The Brotherton Library"—will be commenced shortly, the foundation stone already having been laid by Lord Brotherton himself.

Mr. T. H. Blakeley has been elected to the Gas Research Fellowship endowed by the Institution of Gas Engineers, which has been rendered vacant by the appointment of the previous holder, Dr. A. H. Eastwood, to the staff of the Joint Research Committee of the Institution and the University. Mr. Blakeley has carried out an investigation into the thermal conductivity of materials used for the insulation of high temperature furnaces. As holder of the fellowship, he will undertake further research work in the University under the direction of the Livesey professor of coal gas and fuel industries, on the reactivities of carbonised fuels at high temperatures.

Two special lectures of the series dealing with aspects of biochemistry being given at the Chelsea Polytechnic, Manresa Road, London, S.W.3, will be delivered by Dr. Colin H. Lea, of the Low Temperature Station, Cambridge, on Jan. 28 and Feb. 4, at 6 P.M. The subject of Dr. Lea's lectures will be "Some Recent Advances in the Chemistry of the Fats". Further particulars can be obtained from the principal of the College.

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TECHNICAL Colleges in Great Britain differ noticeably from one another in respect of their devices for maintaining close touch with the changing needs of the various industries which look to them for recruits or for the further education of persons already in employment. This remark is prompted by an inspection of a number of prospectuses for the current session. The Heriot-Watt College, Edinburgh, is conspicuous for the completeness of its system of associating itself with industrial firms. On its board of governors are representatives of printing and kindred trades and engineering employers' associations, coal owners and miners and building trades associations, local trade unions and the fermentation and pharmaceutical industries, and it has advisory committees for the printing trades (8), central mine-rescue station, engineering, mining, building, pharmacy, commercial studies, and stock exchange. The Royal Technical College, Glasgow, has on its committee on chemistry and metallurgy representatives of four firms and the president of the West of Scotland Iron and Steel Institute, and has representatives of firms or industrial associations on committees on engineering, textiles, building, navigation, pharmacy, bakery, and watch- and clock-making. The Technical College, Bradford, has on its college committee the presidents of the Chamber of Commerce and of the Trades and Labour Council. The Manchester Municipal College of Technology has sectional committees for textile industries, pure and applied chemistry, engineering and handicrafts and an advisory committee on industrial administration. Unfortunately, many prospectuses give no indication of the existence of any systematic check being applied to the tendency commonly to be found in teaching institutions in Great Britain to become too academic and out of contact with our industries.

Calendar of Geographical Exploration.

Jan. 24, 1616.—Le Maire Strait.

Two Dutch navigators, Willem C. Schouten and Jacob le Maire, discovered the strait between Tierra del Fuego and Staten Island. They had sailed from the Texel on June 14, 1615, hoping to discover a passage to the South Sea south of Magellan Strait, since only members of the Dutch East India Company might sail either by the Cape route or Magellan's Strait. On Jan. 29 the vessels were off Cape Horn, the southernmost point of the Tierra del Fuego Archipelago, which received its name from Schouten's birthplace, Hoorn. On their journey across the Pacific they discovered Dog Island, in the Low Archipelago, and Boscawen and Keppel Islands, between the Fiji, Tonga, and Samoan groups. They then touched the hitherto unvisited coast of New Ireland. They had hoped to reach the supposed southern continent, and made a survey of the north coast of New Guinea, thinking that this island might be part of Terra Australis. At Java their vessel was confiscated because it was thought that they must have used one of the forbidden routes. They were sent home on another vessel, Le Maire dying on the voyage home. His father, after two years' effort, secured recognition of the fact that a new strait, south of Magellan's, had been discovered.

Jan. 26, 1621.—The Gambia.

Richard Jobson left Tenda, after having sailed up the Gambia river. There he had heard stories of a city in the interior the roofs of which were covered with gold. He concluded that this was Timbuctoo, but that city was really 1000 miles from Tenda.