

Marconi and Radio Communication

At a meeting of the Royal Society of Arts on November 10, Sir Ambrose Fleming presented a paper entitled "Guglielmo Marconi and the Development of Radio Communication". The object of the meeting was to commemorate the achievements of the Marchese Marconi, whose work on the practical use of electro-magnetic waves has laid the foundations of a great industry, and provided a means of inter-communication of great importance and advantage to the human race. Sir Ambrose took the opportunity of tracing the early history of electric wave telegraphy, starting with the theoretical work of Clerk Maxwell published in 1865. The experimental demonstration of the existence of electromagnetic waves was provided by H. R. Hertz some twenty years later, and rapid progress was afterwards made by the investigations of Sir Oliver Lodge, Admiral Sir Henry Jackson and other workers.

CONTEMPORANEOUSLY, Marconi was experimenting in Italy and, at about twenty years of age, he came to Great Britain and applied for his first British patent in June 1896. Marconi had a special flair for the practical application of the principles established by others and for overcoming the many and various difficulties encountered in this application. Under his guidance and inspiration, wireless communication advanced rapidly with a continuously widening scope. Sir Ambrose Fleming was personally associated with much of this pioneer work, and he has drawn on this experience with advantage, in presenting an accurate and interesting outline of the progress of radio communication during the past forty years. When the paper is published in the *Journal of the Royal Society of Arts*, it will form a useful historical document, which should prove of great value to the large and rapidly extending class of young radio engineers who are only dimly acquainted with the course of events in the early years of this art.

Science and the Unobservable

At his Friday evening discourse before the Royal Institution on November 26, Prof. H. Dingle discussed "Science and the Unobservable". An outstanding characteristic of modern physics is the application of the principle that only that which is observable is significant. The first example of such application to arouse general discussion was the abandonment by Einstein of the idea of the absolute simultaneity of events at different places, because of the discovery that it was impossible to determine absolutely whether such events were simultaneous or not. This step met with the criticism that since absolute simultaneity in itself was independent of the means available for observing it, it was illegitimate to call the idea meaningless merely because of the limitations of physicists. On the other hand, the followers of Einstein maintained that if the physical world were regarded as including entities or conceptions which were unobservable either directly or indirectly, there was no criterion for distinguishing the real from the unreal.

An analysis of the process of observation shows that unobservables fall into three classes: (1) the *logically* unobservable, namely, that which cannot be said to be observed without breaking the laws of reason, for example, a round square; (2) the *physically* unobservable, namely, that which cannot be observed because no physical means exists by which the observation could be made, for example, absolute motion; (3) the *practically* unobservable, namely, that which cannot be observed because of lack of technical skill, for example, the far side of the moon. The last two classes, however, cannot be distinguished in practice unless we assume that we know completely all the physically possible means of observation which exist. The practice of physics is to reject the logically and the physically unobservable and to accept the practically unobservable. Hence, since physics distinguishes between the physically and the practically unobservable, it must assume that we know completely all the physical means of observation which exist. From the realist point of view, therefore, we are in the dilemma that we must either assume omniscience in this sense, or else confess that we have no guarantee that what we observe has any importance when compared with the equally real physically unobservable part of the universe. The dilemma disappears if we adopt the idealist doctrine that the physical world is a mental construct formed to give rational meaning to our observations. In that case we reject the physically unobservable because our aim is to construct the world out of observation and not out of fancy, and we do not presume omniscience because we erect no barrier against further observations of any conceivable kind. It follows that modern physics is justifiable only in terms of an idealistic philosophy.

Water Supply and Public Works

A SERIES of papers at the recent Public Works Congress dealt with water supply. The connexion between water supplies and town planning was discussed by Mr. G. H. Thiselton-Dyer, who pointed out that, with few exceptions, sources of water supply are suspect or actually polluted, and that it is doubtful whether even those which are regarded as safe will remain so under the changing conditions of modern life and the scrutiny of the bacteriologist, who can now detect evidence of contamination which was not revealed by older methods of analysis. It was also remarked that it appears to be inexpedient to use the Town and Country Planning Act of 1932 to reserve areas in town planning schemes with the view of preventing pollution, unless the schemes provide for the payment of adequate compensation to the affected landowners. The possibilities of the Lower Greensand as a source of water supply for Greater London was discussed by Mr. H. Dewey, who concludes that no great reliance can be placed upon this source for such a purpose, although use might be made of it as a source of auxiliary supply. The geological section across the London Basin which was included in the paper would have been enhanced in value had the lower limit of the Lower Greensand been shown on it.

RECENT water shortages in various parts of Great Britain lend significance to the paper by Mr. E. G. Bilham on weather and water supplies, in which it is suggested that although the primary source of our water supplies is rainfall, loss of rainfall by evaporation and by seepage is of major importance, and that it is only possible to study this loss by comparing accurate values of rainfall with similar values of runoff. So far, this has only been attempted in the case of the Vyrnwy catchment area. Studies of factors affecting the corrosion of water mains and services are given in a paper by Dr. W. H. J. Vernon and Dr. F. Wormwell, the first portion of which deals with methods of protection of the interior of the pipes, a suggested possibility being treatment of the water conveyed with a view to the elimination of corrosion, and a second method being the application of protective coatings. External corrosion by soil and other causes is also dealt with, together with methods of protection in this instance also.

Fifth Annual Exhibition of Kinematography

THE fifth Annual Exhibition of Kinematography arranged by the Royal Photographic Society was held in the Society's house at 35 Russell Square on November 13-27. The Exhibition included examples of the latest types of kinematographic apparatus, a series of interesting exhibits arranged by technical firms within the industry, together with a comprehensive display of still pictures from recent productions. It was opened by Colonel J. T. C. Moore-Brabazon. In his address, Colonel Moore-Brabazon stressed the importance of kinematography in education, research and in the preservation of records, and paid tribute to the progress which has been made, particularly on the mechanical side and in the general design of apparatus. An interesting series of lectures and demonstrations was arranged to run throughout the course of the Exhibition, on technical subjects connected with kinematography, standard and sub-standard.

It is true to say that this Exhibition succeeded in demonstrating how close is the relationship between the Royal Photographic Society and the kinematograph industry, and how many and great would be the advantages to both of a closer association. In the past a limit has been placed upon the activities of the Royal Photographic Society by the size of the premises at 35 Russell Square. New premises have, however, recently been acquired in which, after reconstruction, there will be three lecture halls, a library, museum, a council room, meeting rooms and a members' lounge, and under these conditions the way will be made easy for further developments. The expense entailed in connexion with the acquisition and reconstruction of the new premises is, of course, very great, and an appeal for funds has lately been launched by the Society. It is hoped that the response will be adequate; science and industry have profited greatly by the advances made in photography, and the premier photographic society in the world deserves well of the community.

The Newcomen Society

AT the annual general meeting of the Newcomen Society, held at the Institution of Civil Engineers on November 17, Engineer Captain E. C. Smith was elected president for 1937-38. In the report of the Council, it was stated that there has been an increase in membership during the year of 149, the total membership now standing at 576, more than half the members residing in the United States. The 300 signed copies of the "Collected Papers of Rhys Jenkins" have nearly all been sold, and Extra Publication No. 4, "John Smeaton's Diary of his Journey to the Low Countries 1755", is in the Press. The financial position of the Society is very satisfactory. After the conclusion of the business a paper was read by Captain F. B. Ellison on "The History of the Hay Railway, 1810-1864". This line, more than 25 miles long, was one of the longest of the pre-steam railways. It was built mainly for the conveyance of coal to a district north of Hereford, hitherto served by pack horses. Its terminus was on the Usk at Brecon, to which a canal had recently been made. First surveyed in 1810, the proposal for a railway, or rather tramway laid with iron rails, met with immediate support, among the contributors to the funds being the Earls of Oxford and Ashburnham, the Duke of Beaufort and Viscount Hereford, who was the chairman of the company. An Act of Parliament for the line was obtained in 1811, and tenders were soon afterwards accepted for 2,800 tons of "Cheltenham tram road plates of strong bodied pig iron to be 50 lbs. per plate" and for 20,000 stone blocks weighing 168 lb. each for sleepers. There were several bridges on the line and one tunnel 600 yards long, this being constructed by a miner of Newnham, Gloucestershire. The tramway continued to serve the district until the formation of the Hereford, Hay and Brecon Railway, which bought up the line, sold the tram plates and used the stone sleepers in its bridges; but recently some of the material has been found in good preservation, and many old documents and plans have been brought to light. These are now being preserved in Hereford Museum.

University College, London: Extension of Buildings

UNIVERSITY COLLEGE, London, by the official opening of a further portion of the Foster Court buildings, has reached another milestone in its development. A previous stage of the Foster Court scheme was marked by the opening of the new Department of Zoology by the Chancellor of the University, the Earl of Athlone, in 1933. The chairman of the University Court, Lord Macmillan, opened on December 1, the sections of the general scheme which have recently been completed. These comprise primarily the housing of the Faculty of Laws, the Department of Geography, the Junior Laboratory of the Department of Physics, the Cast Gallery of the Department of Archaeology, and a library centre for the Foster Court departments. By the terms of the endowment of the Yates-Goldsmid chair of geology and physical geography, the work in physical geography is undertaken in the Department