

that certain red rocks passed through in a boring at Knock-e-Dooney "are identical physically with those which are exposed on the shore to the north-east of Peel," while Lamplugh remarks of the same strata that "they bear no resemblance . . . to the Peel rocks."

As would be expected from his previous glacial work the author has devoted particular attention to the glacial drifts and other superficial deposits of the isle, and in this portion of the book the writer is seen at his best. His principal conclusions are confirmatory of those of Kendall, whose work is fully acknowledged, as, indeed, is the work of all previous writers on Manx geology. He rejects the "submergence" hypothesis, and traces the sequence of events from the gradual formation of the ice-sheet through its various phases to its final disappearance. The thickness of the ice on the bed of the Irish Sea is estimated at not less than 3000 feet. The phenomena that occurred during the melting of the ice have been ably worked out, especially in the north of the island, where the formation of glacial lakes with their overflows is clearly and convincingly described.

The full details given of the metalliferous deposits should be valuable in connection with mining enterprises. The account of the igneous rocks is fairly exhaustive, the petrological descriptions being in the form of notes mainly from the pen of Prof. Watts. Considering the space devoted to the descriptions, it is a pity that the microscopic characters, especially the structures of the rocks, are not illustrated by a plate or a few text-figures.

The volume bears evidence throughout of the author's stratigraphical skill. His facts are well arranged and clearly stated, and his conclusions carry confidence to the reader's mind because there is no appearance of any attempt to make the evidence prove more than the facts will reasonably explain. C. A. M.

MEMOIRS OF PHYSICS.

Rapports présentés au Congrès international de Physique réuni à Paris en 1900. Edited by Ch. Ed. Guillaume and L. Poincaré. 4 vols. (Paris: Gauthier-Villars, 1900.)

WHEN the Société Française de Physique organised its international congress on physics, at the Paris Exhibition in 1900, it was the wish of several members of the commission appointed for that purpose, notably of their distinguished president, M. A. Cornu, whose death we have since had occasion to deplore, that a volume should be prepared which might survive the reunion which gave it origin, and form a suitable record of the same. This happy thought led to the request that a number of investigators should give accounts of their life works, showing the connections with the results obtained by previous investigations, and indicating probable advances in the future. These investigators were asked to forget, for the moment, the multitude of interesting details involved in their researches, and to treat their re-

spective subjects from a general point of view. As a consequence, we have before us a series of memoirs on important branches of physics, each written by a recognised authority, dealing with important and far-reaching advances in physical science. The value of these memoirs is greatly enhanced by full references to original publications.

In the first volume, amongst other important papers, we may notice a paper on the precision of length determinations, by J. René Benoit. This paper contains an account of Prof. Michelson's standardisation of the metre, in terms of the wave-length of light. An interesting paper by P. Chappuis deals with practical and theoretical scales of temperature, while J. S. Ames contributes an article on the mechanical equivalent of heat, and E. H. Griffiths adds an appendix on the specific heat of water.

To the general reader, vol. ii. will perhaps be found of greatest interest. This volume deals with recent advances in optics, electricity, and magnetism; W. Wien contributes an article on the theoretical laws of radiation, which is followed by a paper on the radiation of a black body, by O. Lummer, and another on the emission of light by gases, by E. Pringsheim. These three papers form an excellent introduction to the recent extensions of thermodynamical methods to the theory of radiation. Prof. Lebedew gives an account of his experimental proof of the mechanical pressure of light, while H. Rubens describes his investigations of infra-red waves of great length. A paper by J. R. Rydberg gives a brief account of the distribution of lines in the spectra of the elements. This is a subject which will probably be greatly extended in the future; it may very probably lead to a complete mechanical theory of atomic structure, a domain into which the researches of Lorentz and Zeeman have already given us a glimpse. M. Cornu's paper on the velocity of light will be read with great interest, although it would hardly appear that the author made out a very strong case against the researches of Michelson and Newcomb. A paper on the electromagnetic theory, by J. H. Poynting, should be in the hands of all advanced students of physics. These, together with the remaining articles in vol. ii., render this of unusual interest.

Vol. iii. contains papers on recently discovered magneto-optic phenomena, by H. A. Lorentz; the theory of dispersion and metallic reflection, by P. Drude; and on radio-active substances, by H. Becquerel and by M. and Madame Curie. Prof. J. J. Thomson considers the results of recent researches on the passage of electricity through gases; V. von Lang examines the evidence as to the back E.M.F. of the electric arc, while A. Potier contributes a very readable article on poly-phase currents. C. V. Boys gives an account of the various methods of determining the Newtonian constant of gravitation, with an able criticism of the various values obtained.

The fourth volume contains the minutes of the congress, a number of replies to criticisms and short communications, and, finally, a list of names of the members. E. E.