

everyone who uses the petrol-driven motor-car is at the mercy of the kings of oil finance, who at present are masters of the situation.

Another important matter, that of electrical motor vehicles, is dismissed in a single chapter, although, on account of the recent reductions in the cost of electrical energy, the prospects of this class of vehicle are increasingly good.

In the chapter devoted to the consideration of the efficiency of transmission gear, the matter is dealt with in an ingenious manner, and it is probable that the rough-and-ready method adopted by the author of calculating the transmission losses is within a narrow percentage of being correct. The objects of the tourist trophy race initiated by the Automobile Club are clearly explained, and the cars taking part in the first of these races are tabulated and their performances usefully compared.

Altogether, the author, in this second volume, has been very reasonably successful in dealing with the difficult task of getting together sufficient descriptive matter to satisfy any reasonable inquirer, and has made his matter as short as was possible, considering that he has been compelled to describe a mass of vehicles the bulk of which resemble one another very closely, as most of the designers have copied the main features of two or three Continental models, and only vary in certain details or special methods of cheapening or facilitating manufacture.

THE SOLAR RESEARCH UNION.

Transactions of the International Union for Co-operation in Solar Research. Vol. i. (First and Second Conferences.) Pp. 257. (Manchester: University Press, 1906.) Price 7s. 6d. net.

IN a previous number of this Journal a brief summary was given of the proceedings of this International Union at its second conference, held at Oxford in September, 1905. The volume before us gives a complete historical account of the union from its origin in 1904 up to the end of the work completed at the Oxford meeting, and its appearance is due to the energy of the chairman, Prof. Schuster, who has brought all this useful material under one cover.

The subject is dealt with under seven heads. The first shows that the origin of this union was due to Prof. George E. Hale, who issued a circular letter to a number of men of science interested in solar physics. The receipt of favourable answers led him to approach various societies and academies, with the result that a meeting was arranged and held in connection with the International Congress of Science at the St. Louis Exhibition.

Part ii. deals with the proceedings of the first conference, which took place in September, 1904, and is followed by part iii., which contains *in extenso* the papers submitted to the conference. They include introductory remarks by Prof. Hale on the importance of international cooperation in solar research, and valuable reports by Henry Crew, A. Pérot, C. Fabry, H. Kayser, and Lewis Jewell on the

importance of establishing a new system of standard wave-lengths.

In part iv. we are made acquainted with the preparations for the second conference. A portion of this consisted in sending out circular letters to members of the union and others, relative to such subjects as the fixing of standards of wave-length, measurement of the intensity of solar radiation, work done with the spectroheliograph, and the spectra of sun-spots. In response to these, numerous valuable replies were received, and these are all included in the volume.

At the Oxford conference some important papers were communicated (part vi.), among which may be mentioned the compensating pyrheliometer, by K. Ångström. At this conference the constitution of the union also was discussed, and we have in this volume (part viii.) the text in English, French, and German of the constitution as finally adopted, and the resolutions, also in the three languages, concerning the various important questions discussed.

An important result of the Oxford conference was the appointment of committees to take in hand the work of preparation and organisation of investigations which have not yet been collected and co-ordinated.

In connection with these, the present volume contains a very valuable memoir, drawn up by Prof. Fowler, on the observations of the spectra of sun-spots in the region *b* to *E* (part vii.). This paper brings together in a very admirable manner the main features of the spectrum-analysis of sun-spots, and will serve as a valuable guide to those observers who take up this part of solar physics.

The next meeting of the union will take place at Meudon in May of the present year. There is every probability, therefore, that a second volume of these transactions will make its appearance during the next twelve months.

AGRICULTURAL ANALYSIS.

The Principles and Practice of Agricultural Analysis.

By Dr. H. W. Wiley. Vol. i. Soils. Second edition, revised and enlarged. Pp. xii+636. (Easton, Pa.: Chemical Publishing Co.; London: Williams and Norgate.) Price 18s. net.

DR. WILEY'S treatise on agricultural analysis has long been the chief resource of every worker in that domain, because it contained not merely the particular method in vogue, but to a large degree all the methods that had been proposed or were in use in either American or Continental laboratories, very often in the words of the original. This did not make the book easy to use by the tyro, for Dr. Wiley rarely attempted any criticism or recommended one method beyond another, but the collection was extremely useful to the investigator, and saved him much labour in trying over things which had been tested before. The gain is particularly apparent in dealing with soils, the subject of the present volume, for the analysis of a soil is not like that of a manure, where there is a definite element or elements to be