other. A number of special cases are worked out for both positive and negative rays, and the luminosity at different heights is considered.

Chap. 5, pp. 213–222, comparing theory with observation, gives a brief analysis of the observed heights and contains some historical matter. The α-ray theory of aurora is credited to Prof. Vegard, who has now, however, abandoned it. The author's own conclusions seem, on the whole, in general accord with those now held by Vegard. He considers that the luminosity phenomena of aurora cannot be explained on the α-ray hypothesis except for what he calls "plaques pulsatoires." The most likely sources of all other auroras, he thinks, are cathode rays.

On pp. 221–22 is an interesting statement of what Prof. Störmer takes to be the auroral problems now calling for attention. The observational problems include height measurements in the Arctic and Antarctic, and the investigation of the auroral spectrum at different levels. The first theoretical problem remaining is to take account of the mutual electro-magnetic actions of the corpuscular currents, as well as of the action of the magnetic fields of the earth and sun. "On pourra alors . . . étudier jusqu'à quel point les objections de Shuster (Schuster) relatives à des faisceaux cathodiques dans l'espace sont bien fondées ou non." A second theoretical problem is to apply the knowledge we may gain of the auroral corpuscles to the study of solar physics.

The second paper by Prof. Störmer relates to auroral measurements made during a great magnetic storm on March 22–23, 1920. Use was made on that occasion of seven stations giving bases varying in length from 26 to 250 km. Of the heights measured, six exceeded 500 km., one being 607 km. The plates attached to the paper are enlarged negatives of the photographs obtained. The photograph reproduced here (Fig. 4)

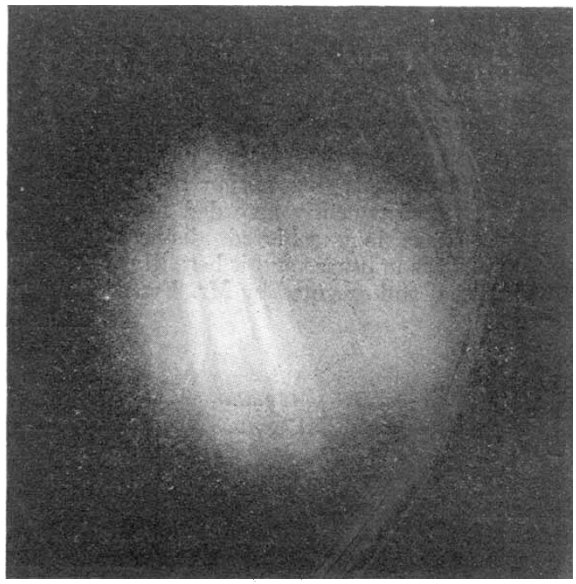

FIG. 4.—Aurora during the magnetic storm of March 22–23, 1920.

is a positive, which we owe to the kindness of Prof. Störmer. The demonstration of the existence of a sensible atmosphere at heights exceeding 500 km. is a notable event

The Meldola Medal.

RAPHAEL MELDOLA was a man of remarkable versatility, eminent to an unusual degree in several sciences—chemistry, biology, entymology, astronomy—and of unbounded energy. How broad his sympathies and interests were, and how distinguished his services, should be sufficiently apparent from the fact that he was elected to the presidential chairs of the Essex Field Club, the Entomological Society, the Chemical Society, the Society of Dyers and Colorists, the Society of Chemical Industry, and the Institute of Chemistry. Apart from the distinctions connected with his scientific pursuits, Meldola was held in high honour among his own people as president of the Maccabæans, a society in London consisting mainly of Jewish professional men devoted to the promotion of the interests of the Jewish race.

That society has instituted a medal in order to perpetuate his memory, and has arranged with the council of the Institute of Chemistry that the

The Meldola Medal.

Meldola medal be presented annually for the most meritorious chemical work of the year ending on the last day of December preceding the award. The award is not to be restricted to any particular branch, but the administrators, who are the council of the institute and a member of the Maccabæans appointed by their committee, will have primary regard to work done in analytical chemistry. The award, however, is restricted to British subjects of not more than thirty years of age at the time of the completion of the work—a condition seldom, if ever, attaching to awards of this kind. It is intended to afford encouragement to young investigators and to imply recognition of high merit—which is more frequently accorded in later life to those who have long achieved distinction. The medal, which is in bronze and is here illustrated, has been designed and executed by Mr. Frank Bowcher.

The council of the Institute of Chemistry hopes that the first award may be made at the annual general meeting of the institute on March 1 next. Chemists are invited at any time prior to Friday, January 20, to direct attention to published work of distinctive character, preferably in analytical chemistry, carried out during 1921. Such communications should be headed "Meldola Medal," and should be addressed to the registrar of the institute, 30 Russell Square, W.C.1.

Meldola died on November 16, 1915, and many will remember that in 1917, by subscription among his friends, two portraits of him, by Mr. S. J. Solomon, R.A., were presented to the Royal Society and the Institute of Chemistry. The medal affords an additional fitting tribute to one of the most notable men of science of our time.

Obituary.

Dr T. A Chapman, F.R.S.

DR. THOMAS ALGERNON CHAPMAN died at Reigate on December 17 last after a long period of failing health, in the eightieth year of his age. His father, Dr. Thomas Chapman, of Glasgow, was in his day an entomologist of high repute, and the life-long devotion of the son to the study of insects commenced at an early age. After graduating in medicine (with honours) and surgery at Glasgow and Edinburgh, Dr. Chapman was for a time resident physician and surgeon to the Glasgow Royal Infirmary, and in 1866 he received an appointment to the Joint Counties Asylum at Abergavenny. He afterwards became Medical Superintendent to the County and City Asylum of Hereford, and during his tenure of this office, from which he retired in 1895, he contributed several important papers to the *Journal of Mental Science*.

A keen and successful collector, and a delightful companion in the field, Dr. Chapman was, in addition, one of the most philosophical of naturalists and the most accurate and painstaking of observers. His long series of entomological memoirs—the Royal Society's Catalogue and the "Zoological Record" enumerate more than 250 separate papers published by him from 1868 onwards in the current magazines and the Transactions of the Entomological Society of London—regarded as a whole, takes rank among the most important contributions to the science of entomology by a single individual in recent years. Some of his early papers deal with the life-histories of certain wood-feeding Coleoptera of great economic importance and interest, but the great bulk of Dr. Chapman's work relates to the Lepidoptera, chiefly from the bionomic and taxonomic aspect. Of late years he devoted considerable attention to the biology of sawflies, and the last paper from his pen on this subject appears in the *Entomologists' Monthly Magazine* for January.

Among the most important of Dr. Chapman's memoirs are those on the value of pupal characters in the classification of the Lepidoptera; on the life-history of the Micropterygidæ, and the true relations of these singular insects, for which he recently proposed a new order, the Zeugloptera; and the life-histories, in some cases previously unknown, of many species of British and European Lycænidæ or "blue" butterflies, and the association of their larvæ with ants and other insects, the material for these researches being acquired in many visits to the Alps and other parts of the Continent in his later years. The solution of the mystery of the larval and pupal life of *Nomiades arion*, for so many years an entomological enigma, is in large measure due to his acumen and patient observation.

Dr. Chapman became a fellow of the Entomological Society of London in 1891, served repeatedly on the council, and was vice-president of the society on no fewer than four occasions; but, to the great regret of his colleagues, he could never be induced to assume the office of president, which was long open to his acceptance. He joined the Zoological Society in 1898, and in 1918 he was elected a fellow of the Royal Society. His genial and engaging personality will be greatly missed by his wide circle of friends and fellow-workers, and very few men were more highly and deservedly esteemed in life or are more deeply regretted in death. J. J. W.

It is announced in *Science* that Prof. Henry Turner Eddy, professor emeritus of mathematics and mechanics in the University of Minnesota and dean emeritus of the graduate school, died on December 18 last at the age of seventy-seven years. Prof. Eddy was professor of mathematics, astronomy, and civil engineering in the University of Cincinnati for sixteen years, and went to the University of Minnesota in 1894 as professor of engineering and mechanics. Later he became professor of mathematics and mechanics. He served both as secretary and vice-president of the American Association for the Advancement of Science, and was also a member of several other learned societies in America.