specting dissociation and the dynamical equilibrium of molecules. How far this attempt will be ultimately successful time alone can show. Mendeléeff had little sympathy with the theory of electrolytic dissociation, which, he declared, was not in harmony with the facts of observation, and was of little use in facilitating our comprehension of the true nature of solution. Nor was he more predisposed towards the conception of electrons, although perhaps his belief in the integrity of the atom was hardly so fundamental as that of Dalton, who would have gone to the stake rather than recant his declaration: "Thou canst not split an atom!"

The story of the rise and development of the Periodic Law is so well known that it is unnecessary now to dwell upon it. By a good fortune, which some may regard as evidence of predestination, Mendeléeff lived to see the verification of his predictions in the discovery, in rapid succession, of gallium, scandium, and germanium; and no seer ever prophesied more truthfully. It was the astonishing accuracy of Mendeléeff's prognostications, and the apparent boldness and confidence with which they had been uttered, that profoundly impressed the whole scientific world, and secured for his generalisation a respect and acceptance for which otherwise it would have had long to wait. This generalisation is now woven into the fabric of modern chemistry, and is universally accepted as the only rational basis of classification. Like many other great natural truths, we are able, on looking back, to discern its germs in the tentative efforts of previous thinkers who more or less dimly appreciated the significance of the facts upon which it is based, but it is perfectly certain that Mendeléeff knew nothing of the prior work of De Chantcourtois and of Newlands, and was no more influenced by it than was Dalton by Richter or by the "Comparative View of the Phlogistic and Antiphlogistic Theories" of William Higgins. In the memorable Faraday lecture which he gave to the Chemical Society in 1889, Mendeléeff, with a true nobility of mind and a modesty which revealed the real greatness of the man, gave adequate expression to his appreciation of the efforts of his predecessors, claiming for himself only courage and intrepidity in placing "the whole question at such a height that its reflection on the facts could be clearly seen."

The Periodic Law has so far stood the test of experience, and each new extension of the science is consistent with its previsions. The inert gases of the atmosphere find their place in the system, and the only radioactive substance the chemical properties of which have been sufficiently investigated has an appropriate position among its correlated elements. In the old days the followers of Stahl sought to make the conception of phlogiston an all-embracing doctrine. Mendeléeff anticipated these attempts as regards his own generalisation by showing that even the universal ether may be included within his system. In his last paper, published in 1902, entitled "An Attempt towards a Chemical Conception of the Ether," he starts with the assumption that the ether possesses mass, and that it has an atomic weight many times less than that of hydrogen, something of the order of $10^{-6}$ when $H=1$; that it is monatomic like argon and helium, and that by its small density and extremely rapid motion it permeates all matter and space. The ether thus becomes, not an affection of matter, but a distinct entity capable of being attracted by elements in proportion to the weights of their atoms, and he held that the phenomena of radio-activity could be explained by the gradual emission of this ether from such substances as uranium and thorium which have the highest atomic weights of the elements.

The truth embodied in the Periodic Law has led many to suppose that this generalisation lends support to, and is indeed the proof of, the validity of the assumption of a primordial matter. Mendeléeff himself declined to see that such an inference was warranted. He saw nothing in the law inconsistent with the idea of the individuality of the elements, holding that until it could be definitely shown that one element could be transformed into another, or that ether and matter were mutually convertible, the elements must be regarded as distinct and separate entities, immutable and unchangeable.

Mendeléeff not unfrequently visited this country, and was personally known to many British chemists, to whom he was always welcome. His tall and commanding presence, his fine head, with its tangle of long, wispy white hair, his expressive features, his guttural utterance, the wisdom and originality of his talk, his shrewdness and sense of fun, all stamped him as an uncommon and strong personality, which immediately made its presence felt in any company in spite of the innate modesty of the man. Of wide liberal views, intensely national, and a great power in the University, Mendeléeff was doubtless a thorn in the side of bureaucratic Russia, and it was currently reported that the frequent foreign missions on which he was sent were so many covert attempts to keep him at arm's-length.

Every scientific honour that this country could pay was awarded to him, and he was profoundly touched and deeply grateful for the sympathy and appreciation thus extended to him. On the occasion of his delivering the Faraday lecture it fell to the writer's duty, as treasurer of the Chemical Society, to hand him the honorarium which the regulations of the society prescribe, in a small silken purse worked in the Russian national colours He was pleased with the purse, especially when he learned that it was the handiwork of a lady among his audience, and declared that he would ever afterwards use it, but he tumbled the sovereigns out on the table, declaring that nothing would induce him to accept money from a society which had paid him the high compliment of inviting him to do honour to the memory of Faraday in a place made sacred by his labours.

T. E. THORPE.

## PROF. ANTONINO MASCARI.

BY the death of Prof. Antonino Mascari on October 18, 1906, solar physicists throughout the world, and more particularly those who were his intimates in the Italian observatories, have sustained a severe loss.

Born at Campobello di Mazzara (Sicily) on December 4, 1862, Mascari proceeded in due course to the University of Palermo, where he took the engineering course and obtained his degree in that faculty in 1887. It was while there that he developed the predilection for astronomical investigations, and, under the guidance of Prof. Riccò, worked with that activity and intelligent ability which were the outstanding features of his whole career. He was later appointed to the position of assistant to the Piazzi Foundation, and thus was fortunate enough to be able to continue his association with Prof. Riccò—an association which has proved of inestimable benefit to the study of solar physics.

In 1892 Mascari was appointed first assistant at the Observatory of Catania, where the solar prominence observations, commenced by Tacchini at Palermo in 1872, were continued. Probably only those who have had to use these Italian observations in discussions of collateral phenomena are aware how well this task was performed, and how much the science of solar physics owes to the indefatigable labours

and lucid exposition of Prof. Riccò's worthy successor. This work was continued right up to the commencement of his last illness, and we find that the discussion of the observations for the first semester of 1906 was carried out, and published in the *Memorie*, by Mascari.

Although his chief work lay in the province of solar physics, Mascari will also be remembered as a careful observer in other departments of astronomical physics. At the Catania and Etna observatories he made careful telescopic studies of various planets, Saturn and Venus among others. During the latter part of 1892 he noted several well-marked features on Venus, and, from their persistence in the same relative positions on the disc, he inferred that the short-period rotation of the planet was out of the question, thus confirming Schiaparelli's conclusion that the period of rotation is equal to that of the planet's revolution in its orbit. Tacchini's observations of about the same date also confirmed this fact.

Mascari was also an authority on the subject of the agitation of telescopic images, more especially that of the sun, due to movements in the earth's atmosphere. In collaboration with Signor A. Cavasino he published an exhaustive memoir on this subject in 1905, discussing the observations of the solar image which were carried out at Palermo and Catania during the twenty-three years 1881–1903.

With Prof. Riccò, Mascari was instrumental in carrying on the work in connection with the Catania zone of the Astrographic Chart and Catalogue, the taking and reduction of a large number of the requisite photographs being due to his personal labours. In 1904 he was nominated adjoint-astronomer at Catania, and took a prominent part in the admirable organisation and direction of the observatory work. But it was in the study of solar physics that Mascari's life-work lay, and it is in solar physics that his loss and the true value of his works will be most keenly recognised. This feeling is ably expressed in an obituary notice by Prof. Riccò, published in the *Astronomische Nachrichten*, to which we are indebted for some of the foregoing particulars.

W. E. ROLSTON.

## NOTES.

THE death on Tuesday of Prof. H. F. Pelham, president of Trinity College, Oxford, and Camden professor of ancient history in the University, at sixty-one years of age, means a great loss to national scholarship and active study. Prof. Pelham took a keen interest in scientific progress, and while a member of the Hebdomadal Council at Oxford he was always on the side of learning and research. Women's education in Oxford had in him a powerful champion, and Somerville College in particular owed a great debt to him for his enthusiastic service on its council. He did much for the promotion and management of the British School at Athens and the British School at Rome, his zeal on behalf of these institutions being based on the conviction of the value of Greek and Roman life and literature as a subject of scientific study. Prof. Pelham was one of the first members of the British Academy.

IN the course of a letter in Wednesday's *Times*, Prof. E. B. Poulton refers to the efforts which have to be made in this country to induce the official representatives of the nation to assist the advancement of science in any particular direction. Instead of seeking the best expert advice upon any subject in which science can be of service, the Government waits to be memorialised before it can be stimulated into action. "The disheartening distance," Prof. Poulton adds, "which, in this respect, separates us from Germany was forcibly brought to my mind at the meeting of the International Zoological Congress in 1901. The fact that the German Empire is penetrated by a belief in the importance and the dignity of science was impressed upon us by the splendid reception in Berlin, by our meetings in the building of the Reichstag, and by every kind of Governmental and municipal recognition and hospitality. . . . In this country, unfortunately, the conviction that science is of national importance is almost confined to that small part of the nation which includes the scientific men themselves. They know that the existence of the Empire depends upon science, and that, if disaster should overwhelm the island centre, it will be for want of science. Scientific men can fairly claim that there is love of their country no less than love of their subject in the attempts to conquer indifference and even dislike in those who bear the responsibility and wield the power."

AN aurora was observed in most parts of the United Kingdom last Saturday evening, February 9, and in many widely separated places the display is described as being brilliant. The time of occurrence was chiefly between 6 p.m. and 11 p.m., and it was accompanied by a considerable magnetic disturbance, particulars of which are given by Dr. Chree in our correspondence columns. It is noteworthy that sun-spots have been unusually prominent recently, and that at the present time no fewer than four distinct groups are visible, one of which can be seen with the naked eye. London, and, indeed, nearly the whole of the south-east of England, was enveloped in a thick fog on Saturday evening, which effectually prevented all possibility of the aurora being seen in this part of the kingdom, but it was seen at Oxford. Reports are numerous from the north and west of England, as well as from Scotland and Ireland. Many observers give the colouring as yellow, green rose-red, or purple, and allude to the flickering or quivering rays. Writing from Winchmore Hill, Amersham (Bucks), Mr. A. M. Davies says that between 10.30 p.m. and 11 p.m. he noticed that the sky was deep pink or crimson in the N.E. and pale green in the N.W. At intervals beams of light were seen at various points, all radiating from some way below the northern horizon. Sometimes there was also a flickering effect, as though horizontal bands of light and shade rose up in quick succession. Dr. W. N. Shaw, director of the Meteorological Office, has kindly sent us a letter received by him from Mr. G. A. Clarke, the observer at the Aberdeen University Observatory. The following extract from this letter describes the chief characteristics of the display:—"The first faint streamers were seen by me a few minutes before 6 p.m., directed from N.N.W. towards the zenith. About thirty minutes later these had increased in brilliancy, while an extended diffuse greenish glow was visible in the N.E., and a faint white band crossed the zenith from E.N.E. to W.S.W. This band rapidly increased in brightness and size until it finally became a bright greenish-white zone girdling the sky from E.N.E. to W.S.W. horizons, and between 50° and 60° south of the zenith. It passed right through the 'belt' of Orion. At 6.45 p.m. a patch of deep red appeared in the north, accompanied by some very bright greenish-yellow streamers. The streamers increased in quantity, and worked upwards toward the zenith, while the band above-mentioned remained steadily in its position until after 9 p.m. Two other faint bands formed near the zenith, but they were merely transitory. Between 7 p.m.