Of the more personal side of Einthoven's life one might write of the grace, beauty, and simplicity of his character. He spoke with ease three languages as well as his own; he was a regular attendant at international gatherings; he threw all his influence on the side of good international relations in science. Last summer he was present at the International Congress of Physiology at Stockholm, and attended the various functions, and took part in many of the excursions, including a trip to the north of Sweden and back by sea along the Norwegian coast. It was a wonderful thing to be his guest and to enjoy the delightful hospitality of his home. He invited me some years ago, while we were attending a German congress of physiologists at Tübingen, to stay with him at Leyden on my way back to England. We arranged to meet at a station in North Germany and to travel the last part of the journey together. I waited until his train arrived. He came literally running along the platform to meet me, seized my bag out of my hand, carried it to the carriage, where he had kept me the best seat, and made me feel that whatever the difference of our age and position, I was from that moment his honoured guest. In 1924 we sailed together to America, and at night under the starlit sky we walked on the upper deck discussing the random movements of electrons in conducting fibres and other matters equally strange. These personal details will emphasise what a loss his passing will be, not only to his older colleagues and to his younger friends, but also to all the good fellowship of physiologists throughout the world.

Einthoven was elected an honorary member of the Physiological Society in 1924, and in return he invited the Society to hold one of its meetings in his laboratory. The occasion will be a happy memory in the minds of those who were able to go to Leyden in April 1925. In 1924 he visited the United States to deliver a course of lectures at Boston, and while there, the award to him of the Nobel Prize for medicine for 1924 was announced. He was elected a foreign member of the Royal Society in 1926.

A. V. H.

PROF. SVANTE ARRHENIUS, FOR. MEM. R.S.

THE annals of physical science bear abundant testimony to the native genius and energy of Sweden, and in this respect Svante August Arrhenius, who has just passed away, upheld with honour and distinction the reputation of his country. Born near Upsala in 1859, as the son of a land steward, Arrhenius obtained his early education in the school and university of that town, moving later to the University of Stockholm, the atmosphere of which was more congenial and stimulating to the young physicist. His researches there on electrical conductivity and its relation to chemical activity, although lightly esteemed by the Upsala professors, brought him recognition abroad, whilst the theory of electrolytic dissociation, put forward in 1887 during his *Wanderjahre*, secured for him an established position in international science.

During these *Wanderjahre*, with financial support provided by the Swedish Academy of Sciences, Arrhenius visited quite a number of active research centres. Thus he worked with Ostwald at Riga, and later at Leipzig (the laboratory which van 't Hoff in 1888 termed the 'Hauptagentur fur Ionenspaltung'), with Boltzmann at Graz, with Kohlrausch at Würzburg, and with van 't Hoff at Amsterdam.

Refusing an invitation to settle at Giessen, Arrhenius returned to Sweden in 1891, and acted first as lecturer and afterwards as professor in the newly established Technical High School at Stockholm. Somewhat later he acted as Rector of the same institution for a number of years. Giessen was not the only foreign university which made an effort to secure Arrhenius, for in 1905 he was invited to Berlin. This honour was likewise declined, and in the same year he was appointed Director of the Nobel Institute at Stockholm. Arrhenius occupied this position up to the time of his death, and the numerous communications published by the Institute bear witness to the activity of this centre of research under his inspiring leadership.

Arrhenius was a frequent visitor to England, and although his scientific views met with a critical reception in various quarters, his genial and attractive personality made him always a welcome guest. His work secured extensive recognition from British scientific bodies, and he was a foreign member or honorary fellow of the Royal Society, the Chemical Society, the Physical Society, and the Royal Institution. Honorary degrees were conferred on Arrhenius by the Universities of Oxford, Cambridge, Birmingham, and Edinburgh, whilst the Royal Society awarded him the Davy Medal in 1902, and by invitation of the Chemical Society he delivered the Faraday Lecture in 1914.

In Europe and America also his international standing was marked by his election as corresponding member of numerous academies and learned societies, whilst honorary degrees were conferred on him by the Universities of Heidelberg, Groningen, Oslo, and Leipzig. Further, he was the recipient of the Nobel Prize for chemistry in 1903.

The honoured place which Arrhenius occupied in physical science was without doubt mainly due to his bold and original ideas on the condition of dissolved electrolytes, as expressed in his theory of electrolytic dissociation, and it is on this ground that he is justly regarded as one of the founders of modern physical chemistry. The genesis of this theory in Arrhenius's mind, on the basis of his own experimental work and in correlation with van 't Hoff's researches on osmotic pressure, is worth recalling, for it constitutes one of the most interesting chapters in the history of physical chemistry.

Investigation of the electrical conductivity of forty to fifty substances in dilute aqueous solution had led Arrhenius in 1883 to two striking conclusions: (1) that in regard to conduction of the electric current only part of the electrolyte is to be regarded as 'active,' this proportion increasing on

dilution, and (2) that there is a parallelism between the 'strength' of an acid and its electrical conductivity. The conception of the 'activity coefficient' as a 'degree of ionisation' came later, and was not published until Arrhenius had become acquainted with van 't Hoff's memoir on the extension of the gas laws to solutions. The abnormal behaviour of dissolved salts, expressed by the van 't Hoff factor i in the equation $pv = iRT$, was precisely the point on which Arrhenius fastened as of special significance for his theory of dissociation. He writes from Würzburg to van 't Hoff under date March 30, 1887: "Die Abhandlung [*i.e.* van 't Hoff's memoir] hat mir nämlich in unerhörtem Grade Klarheit geschafft uber die Konstitution der Lösungen," and he proceeds to the correlation of osmotic abnormality and ionisation. This correlation was the main feature of the communications made by Arrhenius in 1887 to the Swedish Academy, and of the classical paper "Über die Dissociation der in Wasser gelösten Stoffe," published in the *Zeitschrift für physikalische Chemie*. An early announcement of these new developments was made also to Sir Oliver Lodge as secretary of the British Association Committee on Electrolysis.

It was fortunate for the propagation of Arrhenius's ideas that he was in alliance with van 't Hoff, and that he had such an able and enthusiastic advocate as Ostwald. The newly established *Zeitschrift für physikalische Chemie*, run mainly by Ostwald, provided an effective platform for the discussion of the new theory and the relevant experimental investigations. Arrhenius's views evoked strong opposition in many quarters, but as the years passed the utility of this theory as a basis for the study of solutions *on quantitative lines* became more and more apparent. The theory stimulated a prodigious amount of research, and if modifications have been made and are still being made, the ideas of Arrhenius have nevertheless yielded an abundant harvest.

In the experimental investigation of problems suggested by the new views on solution Arrhenius himself, as well as his co-workers in the Nobel Institute, took a prominent part. Such matters as the diffusion of electrolytes, neutral salt action, the hydrolysis of salts, the catalytic activity of acids, isohydric solutions, were examined from the viewpoint of electrolytic dissociation, and the extent determined to which the new theory was capable of giving a quantitative account of each case.

The study of physiological and biological problems on quantitative physico-chemical lines was another field in which Arrhenius was active, both theoretically and experimentally. He concerned himself more especially with serum therapy, and many of his original papers and books deal with aspects of this subject, such as the relation of toxins and anti-toxins.

From serum therapy to cosmogony seems a long step, but the latter also was a subject in which Arrhenius was deeply interested, and the varied problems of which occupied much of his thoughts. The nature of planetary atmospheres, the genesis of the solar system, the origin of the aurora, the influence of carbon dioxide on the temperature of the earth, the function of light pressure, and the periodicity of certain natural phenomena were among the problems on which Arrhenius expressed fresh and original views.

The contributions of Arrhenius to serum therapy and to cosmogony were both striking and important, but without doubt the honourable and permanent place which his name occupies in the roll of men of science is due, not to his work in these two fields, but to the fresh impetus given by him to the study of solutions on quantitative lines. J. C. P.

THE RIGHT HON. THE EARL OF IVEAGH, F.R.S.

THE Earl of Iveagh, who died on Oct. 7 in his eightieth year, distributed large sums for public objects. Consideration for the sufferings of others was one of his noblest characteristics, and his contributions to hospitals in Dublin and elsewhere were on a princely scale. When the Boer War broke out, he equipped the Irish Field Hospital, and during the Great War he spent vast sums in increasing the provision for our sick and wounded. Lord Iveagh was, however, a philanthropist embued with a spirit of social reform. The urgent appeal of sickness and suffering is responded to by many according to their means, but other of Lord Iveagh's repeated acts of benevolence indicate a considered scheme to increase the well-being by improving the health of the people.

In 1889, Lord Iveagh gave £250,000 for the substitution of sanitary dwellings for slums in Dublin and London. Nine years later he provided a similar sum to improve a congested and noisome area abutting on St. Patrick's Cathedral, Dublin. By this scheme the old dwellings and streets were done away with and a public garden of about two acres was provided around the Cathedral. Upon the rest of the seven and a half acres model dwellings for working people were erected, with a central play-hall for the children.

Prior to 1907 the congested state of the old markets in Dublin and the surrounding areas was not only an eyesore but also a serious menace to the public health. At this date Lord Iveagh bought up the whole area, built modern markets, and presented this valuable property to the city. He was, indeed, a practical hygienist, for there is no better means of improving the health of an urban population than providing it with good housing and opportunities to spend more time in the open air and sunlight. One of the latest of Lord Iveagh's benefactions was destined to increase the facilities for recreation in the open air of the citizens of London. In 1925 he purchased the residue of the Ken Wood property adjoining Hampstead Heath, which the Preservation Committee had been unable to acquire owing to exhaustion of its resources. The whole of this fine place of woodland now becomes public property.

The idea of furthering the public health by stimu-