done *to help them;* I mean *our manufacturers* generally. Let me remind you that the Chemical Society *was established for the general advancement of chemical science as intimately connected with the prosperity of the manufactures of the United Kingdom:* these very words form part of our charter. Yet to how small an extent is it recognised that chemistry is of service—that many of our manufactures, in the words of our charter, mainly depend upon the application of chemical principles and discoveries for their beneficial development? It is of no use to manufacture goods if you cannot sell them, and that is too often our position. Every teacher of any standing in Germany can count on placing his students so soon as he is in a position to state that they are fully capable and worth a trial; but here there is no such relationship established between the schools and the works; no proper opportunity is given to young men to prove their fitness for an industrial career. It is not even recognised that the discipline afforded by the study of our subject is an admirable preparation for an industrial career. Take the brewing industry, which in this country has availed itself far more than any other of our services—the brewer is called on to conduct operations involving chemical changes of a most complex and delicate character, subject to variation if the slightest departure be made from a very limited range of conditions, and this too with a material subject to constant fluctuation in composition and character, requiring the most vigilant and appreciative watching. Every brewer ought consequently to have received a chemical training; yet those who enter this industry are, with very rare exceptions, pitchforked into it as raw lads from school, without any preliminary training whatsoever, having received their position through the influence of a friend and from no merit of their own. The same might be said of the dyeing industry, of that of gas manufacture, and of many others. Some of you may have seen the list of subscriptions to the proposed Schorlemmer laboratory at the Owens College, Manchester, and may have marked with sorrow, as I have done, how few and small are the contributions from those connected with the local industries, and how large and numerous relatively are those from friends and admirers of the deceased chemist and from members of the college staff. Contrast with this the great number of subscriptions towards the erection of the Hofmann-Haus in Berlin. Although the comparison is not quite a fair one, perhaps, yet it illustrates my meaning, the reception accorded to the Manchester scheme being sufficiently indicative of the absence of appreciation of the real value of chemical science to industry in one of our chief industrial strongholds. . . .

The proposed Teaching University in London and the Commission on Secondary Education may help in an extraordinary degree to improve our position. But it is to be feared that our subject will not attain to its proper condition unless some action be taken which will consolidate the teaching—which will lead to the centralisation of students of chemistry proper, so they may enjoy the inestimable advantage of intercourse, and have at their disposal a complete staff of competent teachers, each one of whom thoroughly represents some special branch of the subject; so long as students are distributed about the town in half-dozens and each chief teacher is called on to cut himself up into any number of small pieces, so as to deal with the subject of chemistry as a whole, true higher teaching is impossible.

Much to be feared, also, is the tendency to over-estimate the value of examinations, and the great work of the future will be so to improve these that they shall have no prejudicial influence on the student's work and in no way check the development of original methods of teaching; we must fix our attention mainly on the influences to which the student is to be subjected during his career; the competent teacher will ever study his students while they are at work, and do the best for them, provided he be not rendered powerless by the trammels of an examination system which heeds "results" only and not individuals.

Finally, let me say that, while sympathising most fully with those who advocate a complete course of study, I feel that it is very easy to demand too much—very easy to make it impossible for students to do justice to their work by imposing too many subjects. Our chief desire must always be that students shall acquire a knowledge of scientific method and the power of working independently. Certain subjects must be insisted on—for example, mathematics and drawing: if a knowledge of these be not acquired early it will never be acquired; but apart from these and a competent knowledge of the main subject, we probably may, as a rule, be satisfied with comparatively little. Those who have once learnt to work and acquired a knowledge of scientific method will of their own accord, in proportion to their intelligence, apply themselves also to the study of other subjects—as many among us have done; those who are not sufficiently intelligent to do this are not, as a rule, improved by being forced to pay attention to unpalatable studies; on the contrary, they are, more often than not, thereby hindered from acquiring a competent knowledge of some one subject which does appeal to them, and are spoilt for life in consequence.

## SCIENTIFIC SERIALS.

*Bulletin de l'Academie Royale de Belgique*, No. 4.—On the hydrates of the alkyl-amines, by Louis Henry. It has been known for some time that ammoniacal bases form compounds with water, a typical example being $2CH_2 . 2NH_2 . H_2O$, ethylenic diamine. Their properties have not yet been fully investigated. The author distinguishes between hydrates whose bases are soluble, and such whose bases are insoluble in water. He deals with methyl, ethyl, propyl, butyl, and amyl compounds, with the aromatic series, and with nitrites and amides. Their density increases with the percentage of water contained in them, even if the molecular weight diminishes. Their power of combining with water increases with their solubility and their richness in hydrogen, whether this be contained in the nitrogen radicle or the hydrocarbon.—On the creation of an International Bureau of Bibliography, by M. Mourlon. M. F. Vander Haeghen had proposed to the literature class of the Academy to initiate a movement for the compilation of a universal catalogue of public libraries. This proposal coincides with that for the establishment of a comprehensive and international catalogue of scientific papers, brought forward by the Royal Society. M. Mourlon proposed the deputation of three delegates to confer with the other two classes of the Academy with a view towards co-operation with the Royal Society.—On the aurora borealis observed at Louvain on March 30, 1894, by F. Terby. The author points out the recurrence of the monthly period previously observed in the appearances of February 28 and March 30.—Vascular hyphæ of the mycelium of the Autobasidiomycetes, by Ch. van Bambeke. The mycelium in question always contains vascular hyphæ, varying in number, distribution, dimensions, and form according to the species of mycelium. They are larger than ordinary hyphæ, and are usually cylindrical, with occasional fusiform or claviform extensions. They consist of a thin, extensible, and elastic envelope containing a substance which is usually homogeneous and highly refracting, but sometimes granular. They may be considered as a conducting apparatus playing an important part in the distribution of nutritive materials.

*Symons's Monthly Meteorological Magazine*, June.—The May frost of 1894. M. Symons publishes minimum temperatures in the shade, obtained from forty-six counties in England and Wales, in which the thermometer fell below the freezing point between the 20th and 22nd May. In six counties minima of 25° or lower were recorded, while on the grass, readings of 18° in Nottingham, and 19° in Stafford were registered. The readings were not excessively low for May, which has always a cold period about the middle or latter part, for during a frost in May 1891 these low temperatures were exceeded by about 1°. Letters from correspondents show that the wide-spread disaster to vegetation was caused not so much by the lowness of the air temperature, as by the radiation, which was facilitated by the clearness of the sky, while owing to the mildness and dampness of the weather previously the vegetation was more forward and fuller of sap than usual, which froze and burst the cells by expansion. The frost was, as usual, most severe in the lowlands, near streams, and except in the north-east, where the temperature just touched 32°, none was recorded on the English sea-coast.

## SOCIETIES AND ACADEMIES.

### LONDON.

Royal Society, May 31.—"Propagation of Magnetisation of Iron as affected by the Electric Currents in the Iron." By J. Hopkinson and E. Wilson.

Consider a solid, cylindrical electromagnet, it is well known that, in reversing the magnetising current, the induction does