validity of Prof. Vegard's theory, some useful information might be gained by directing more attention to the *phosphorescence* of solid nitrogen. Does the phosphorescent nitrogen band $\lambda = 5231$ Å appear in the spectrum of the aurora or not? If it can be shown that it does, we shall know that the region in which the auroral light originates is at or near the temperature of liquid hydrogen. If this line does not appear in the spectrum of the aurora, and if the temperature of the region in which the radiation constituting auroral spectra originates is at or near the temperature of liquid hydrogen, then why does the phosphorescence nitrogen spectral band not appear along with other nitrogen bands found in auroral spectra by Vegard, Rayleigh, and others.

From Kayser's "Handbuch" one finds that a line or narrow band has been found by different observers in the spectrum of the aurora with the following wave-lengths: $\lambda\lambda = 5269$ Å, 5205 Å, 5200 Å, 5233 Å, 5210 Å, 5239 Å, 5207 Å, 5228 Å, 5235 Å, 5166 Å, and 5230 Å; but the list of wave-lengths observed by Vegard in the auroral spectrum and given by him in his paper in the *Phil. Mag.* of July 1923 contains no wave-lengths between $\lambda = 4708{\cdot}7$ Å and $\lambda = 5578{\cdot}2$ Å. It appears, however, from a statement in one of his more recent papers, that he has observed in the spectrum of the aurora a trace of a line near $\lambda = 5230$ Å. Cario has found a band in the spectrum of oxygen near $\lambda = 5230$ Å, and Prof. A. Fowler recently pointed out to me that Ångström and Thalen found a negative band in the spectrum of nitrogen at $\lambda = 5227{\cdot}5$ Å. It seems very desirable, then, to repeat the observations on the auroral spectrum to see if there is any trace of a wave-length at or near $\lambda = 5231$ Å. If such a spectral line or band should be found, it would be well to have a very exact determination of the wave-length made in order to decide whether the corresponding radiation originates in nitrogen in the gaseous or solid state, or in some other element in one or other of its states.

It is unfortunate that Prof. Vegard's brilliant prediction has not as yet received experimental confirmation. It would appear that neither he nor we have as yet obtained with nitrogen or argon, or with mixtures of these two elements at the temperatures of liquid hydrogen or helium, by the use of any agent, a spectrum that includes a broad line or narrow band within a region of 10 Å on either side of the famous "green line," the wave-length of which, according to measurements made with great precision by Babcock, is $\lambda = 5577{\cdot}35$ Å. Nevertheless, Prof. Vegard's theory has been most stimulating, and has led already to the discovery of valuable and important experimental results.

J. C. MCLENNAN.

The Physical Laboratory,
University of Toronto, December 6.

The Life of Lord Rayleigh.

HISTORY should have as little fiction attached to it as possible and evidence should be tendered in time, by those who can speak with knowledge: this view may not be in accordance with practice: none the less, it may be advocated as desirable doctrine, especially as it has the authority of the author of *Zadig*—a saint recommended for worship by Huxley—who has said:

> On doit des égards aux vivants,
> On ne doit aux morts que la vérité.

All who knew the late Lord Rayleigh even distantly—he was very difficult of approach—will agree with Sir J. J. Thomson (NATURE, December 6, p. 814) that his son has written his Life with remarkable skill and sense of proportion—but some of us can scarcely admit that nothing more is to be said even of the discovery of argon. The account given is only partial, in no way a complete presentation of the episode; among others, we should like to have heard the views of Gordon, the discoverer's devoted laboratory servitor. Lord Rayleigh was but young at the time of the achievement and cannot have been aware of the state of feeling among chemists—nor, probably, was his father; he will not know in what reverence we held his father's work. I suppose I was behind the scenes as much as anyone, the more as I was president of the Chemical Society, was thoroughly acquainted with Ramsay and his ways and, as is well known, an intimate friend of Sir James Dewar.

At the annual general meeting of the Chemical Society, on March 27, 1895, I made the following statement, to the fellows, in my address:

> Your Council have decided to appoint Lord Rayleigh our Faraday lecturer and to request his acceptance of the Medal in recognition of the important service which he has rendered to Chemistry by his discovery of Argon.

I handed the medal to him from the presidential chair—he accepted it. His guarded remarks in acknowledgment are on record in our Journal. The Chemical Society advisedly took the view that it was *his* discovery. There was the strongest possible feeling among chemists that his name alone should have been associated with the discovery. I may add that, on the same occasion, I had the pleasure of calling upon Ramsay to make public his startling discovery of helium in cleveite, which was thereupon confirmed by Crookes.

Lord Rayleigh has dealt mainly with his father's electrical work (on the ohm and the ampere) and that on argon. Probably some of his readers are disappointed that he did not also summarise his activity in other directions—particularly his work on oil films and capillarity, which is proving to be of special interest and importance in our field. If I be not mistaken, the part he took in such inquiry is not sufficiently recognised. If another edition be called for, let us hope that a chapter on his work in general will be added.

As to my friend Sir Joseph Thomson's gibe at chemistry—what is chemistry? I hold that chemistry and physics are inseparable disciplines, the parting line a broad valley through which both flow; the pity is that physicists so rarely stray from their own region up the chemical slope, that their vision is so little adjusted to our country. They suffer, indeed, from *Chemo-myopia*, not *Chemotaxia*; I fear the fault is congenital. Apart from Regnault and Rayleigh, I believe determinations of the density of gases are all but entirely the work of chemists—has not Sir Joseph heard of Avogadro's theorem and of one Cannizzaro, a chemist and Roman Senator? The determination of gaseous density is *the* fundamental operation in chemistry, as he will see if he consult a bygone classic, Cooke's "New Chemistry." Gaseous density is the foundation stone of our entire numerical system. What, however, can they know of chemistry who only physics know? Indeed, there would seem to be a constitutional aversion from our science in the mind of the physicist—he lacks the necessary freedom of outlook to appreciate our numberless excursions. The slowness with which Lord Rayleigh saw the treasure beneath his feet was probably owing to the fact that he had little real chemical feeling; Ramsay at once appreciated the value of the find when asked to inspect the ground and took shares without hesitation.

HENRY E. ARMSTRONG.

55 Granville Park,
Lewisham, S.E.