

application of Kirchhoff's law sometimes leads students to imagine that the two quantities are identical, but Kirchhoff's law applies only to purely thermal radiation (*cf.* Wood's "Physical Optics," chapter xix.). A gas, such as hydrogen, in its non-luminous condition does not absorb selectively the light emitted by luminous hydrogen. I do not think that any absorption bands in non-luminous hydrogen have been detected; they are probably far in the ultra-violet, and there is no reason for supposing that their wave-lengths will be connected by any formula similar to that of Balmer.

The reason for the difference in the frequencies of the absorption bands and the lines in the emission spectrum is sufficiently obvious. The emission of light by a gas is doubtless connected with the ionisation of its atoms. But, when an atom is ionised, the electrons in or surrounding that atom are subject to forces entirely different from those which act upon them when the atom is ionised; there must be a corresponding difference in the periods of free vibration. The absorption bands probably represent the vibrations of the electrons in the neutral atom, the emission spectrum those of the electrons in or around the ionised atom.

Nor is there any reason why the refractive index of a luminous gas should differ greatly from that of a non-luminous gas, except in the immediate neighbourhood of a line in the emission spectrum. (It is relevant to note that Drude's formula cannot be applied to such regions.) Only a very small proportion of the total number of atoms present is ionised even under the most favourable experimental conditions; most of the atoms are not ionised, and affect the light in the same way as those of a non-luminous gas. Of course, if the refractive index due to the luminous atoms were really infinite, the refractive index of the luminous gas would be infinite, however small the proportion of luminous atoms. But it is impossible that it should be infinite; if Balmer's formula were accurately true for all values of  $m$ , there would be an infinite number of lines in the emission spectrum, implying an infinite number of degrees of freedom in the vibrating system. According to the modern view, which seems to be accepted by Prof. Schott, this system is composed of discrete charged particles possessing a finite mass; the number of such particles must be finite, and they can only have a finite number of degrees of freedom. Experiment can never demand an infinite number of lines, for, if  $m$  is very great, the lines are so close as to be beyond the range of resolution.

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#### The Oligochætous Fauna of Lake Birket el Qurun and Lake Nyassa.

IN NATURE of August 1, 1907 (vol. lxxvi., p. 316), Messrs. Cunningham and C. L. Boulenger wrote a preliminary account of the fauna of Lake Birket el Qurun. I am indebted to these gentlemen for the opportunity of supplementing their account by a note upon the Oligochæta of that lake. They were so good as to send to me two tubes with a large number of specimens of a small oligochætous worm collected in the lake. These specimens were found to belong, without exception, to the species *Paranais littoralis*. The occurrence of this Naid in northern Africa is a new fact in its distribution. It has hitherto been met with in many parts of Europe, both in fresh water and in brackish, even salt, water. As to its marine habitat, it has been collected on the shores of Denmark and near Odessa.

It is clear from the fact that this was the only aquatic Oligochæte met with by Messrs. Cunningham and Boulenger that it must at least be a prevalent form in the lake.

Mr. Cunningham has also kindly placed in my hands some examples of aquatic Oligochæta from Lake Nyassa. These belong to three species, and the contrast with the oligochætous fauna of the North African lake is very marked. The genera represented in Nyassa are *Dero*, *Nais*, and *Pristina*. Unfortunately, none of the examples

submitted to me are sexually mature. The *Pristina* I identify with *Pristina longiseta*, a widely spread form. The genera *Nais* and *Dero* are also found in many parts of the world, and as all three genera have already been recorded from tropical East Africa (Michaelsen in *Zeitschr. f. wiss. Zool.*, Bd. lxxxii., 1905, p. 289), there is no cause for surprise at their occurrence in Nyassa. Still, the fact seemed to me to be worth putting on record.

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#### THE FORTHCOMING DUBLIN MEETING OF THE BRITISH ASSOCIATION.

THE British Association will hold its fourth meeting in Dublin on September 2-8 of this year. The three previous meetings took place in 1835, in 1857, and in 1878. The 1878 meeting drew an attendance of 2578, which was well above the average, and it was marked by the presence of an unusually large number of men distinguished in scientific or other work at the time and since. In his presidential address before the Anthropology Section, Prof. Huxley spoke prophetically about those "who may be here thirty years hence—I certainly shall not be," little realising how both his prophecies were destined to come true.

Appropriately enough (though, I believe, not consciously in connection with Huxley's forecast), the invitation for 1908 originated with Prof. W. H. Thompson, of the physiological laboratory of Dublin University. It was originally intended for 1907, but 1908 was found to be more suitable, and the invitation was formally accepted at York in 1906, where a deputation attended consisting of the Provost of Trinity College, Prof. Thompson, Dr. Tarleton, Monsignor Molloy, Rev. Dr. Delaney, and the Lord Mayor of Dublin. The invitation was formally renewed at Leicester by Prof. Thompson, Rev. Dr. Delaney, and Sir Howard Grubb. At a first meeting at the Dublin Mansion House, general and executive committees were appointed, and these have been at work ever since, with the result that the arrangements are in an advanced state of preparation. Subcommittees were appointed to deal with finance, entertainments, hospitality, and the handbook respectively. The four local secretaries are Dr. Joseph McGrath, secretary of the Royal University, Prof. W. E. Thrift, Prof. W. H. Thompson, and Mr. John Mulligan, of the Hibernian Bank. About 3000l. has already been subscribed towards the expenses of the meeting. The reduced fare tickets will be available for a month, so as to include the excursions subsequent to the official meeting. Day excursions will be arranged during the week of the meeting to the Devil's Glen and Glendalough in county Wicklow, to Powerscourt Waterfall and the Dargle near Bray, to the Boyne Valley, and to the Shannon Lakes.

The presidential address will be delivered by Mr. Francis Darwin, F.R.S., on the evening of Wednesday, September 2, in the large hall of the Royal University. Here also will be delivered two of the evening discourses, one on "Halley's Comet," by Prof. H. H. Turner, F.R.S. (Friday, September 4), the other on "The Lessons of the Colorado Cañon," by Prof. W. M. Davis, of Harvard University (Monday, September 7). The third evening discourse will be delivered to operatives on Saturday, September 5. To this discourse ordinary members will not be admitted. The lecture hall has not yet been decided upon.

The serious work of the sections will, for the most part, be over each day by two o'clock, leaving the