

LETTERS TO THE EDITOR.

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Scope of the Royal Society.

As a general principle it is not desirable to make the affairs of the Royal Society a subject of public discussion. The question to be submitted to the consideration of the fellows on May 9 is, however, of sufficient general interest to justify an exception.

The notice given has been short, and I am unable to be present. No vote is to be taken. It will, therefore, not be too late to draw attention to some facts which appear to me to have been overlooked.

The starting point of the matter as it is presented to the Society is contained in the following statement:—

“The Society exists for the promotion of Natural Knowledge. The interpretation of the term ‘Natural Knowledge,’ according to the present practice of the Royal Society, assigns to it a range from Mathematics to the various Biological sciences, and this secures the inclusion of the scientific study of man in his biological relations. It has been argued that this range might be properly increased by the inclusion of the scientific study of man in his reasoning, social and historical relations. It may, indeed, be further contended that the Society should include in its scope all branches of Natural Knowledge which are capable of consecutive and ordered development. Such a test would permit the inclusion of subjects such as Psychology, Economics, Historical Science and Philology in the widest sense of the term, which, under the present practice of the Society, may be deemed excluded, but which, when pursued as they now are by the most capable students, in a scientific spirit and by scientific methods, do fall within the domain of Natural Knowledge. The investigation, for instance, of the phenomena of the origin and variations of human speech, of the beliefs and customs of primitive man, of the production and distribution of wealth, of the laws which govern the development of political societies, is an investigation into natural phenomena in a sense which the progress made in our conceptions of nature during the last two centuries seems to justify.”

Now I have always understood—and my impression is confirmed by the highest authority—that admission to the Society is actually open to any one who has promoted Natural Knowledge, in whatever field, by scientific methods. The open door may not have been taken advantage of, but I am not aware that there is the smallest ground for believing that it has ever been closed. What I wish to draw attention to is that though the actual representation of the subjects enumerated above may not have been as full as it might have been, I am unable to agree that they, “under the present practice of the Society, may be deemed excluded.” A rather cursory inspection of the names of those who have been fellows, or have been elected during the last twenty years, confirms my opinion. Under Economics I find Heywood, Newmarch, Sir James Caird, Jevons, Palgrave, Sir Robert Giffen, Charles Booth and Shaw-Lefevre. I am under the impression that for the period this is a very fair, if not actually adequate, representation of economic science. Historical Science, I presume, must be taken to include archæology and ethnography, otherwise these will have again to be “deemed excluded.” Assuming that this is not so, I find the names of General Pitt-Rivers, Sir Augustus Franks, Canon Greenwell, Tylor, Penrose and, in the list now recommended by the Council, of Arthur Evans. Of Historians, in a restricted sense, I find Dean Stanley and Sir Henry Howorth, and, if Privy Councillors are included, of Bryce and John Morley. And with regard to the class of Privy Councillors, it is to be remarked that although any one is eligible it is apparently rare for any to be elected without something more than mere political qualifications. Philology has been more weakly represented; still, I find the names of the Dean of Canterbury, Alexander Ellis, Sir Henry Rawlinson and Bryan Hodgson. And if Psychology finds its only representative at the moment in Lloyd Morgan, it is, I believe, an open secret that Herbert Spencer might, had he thought fit, have been a fellow of the Society.

Besides the names I have enumerated, I am very much disposed to doubt if a score can be enumerated, or perhaps even half that number, of others in the same fields who during the

last twenty years possessed conspicuous claims to admission to the Society. Nor can I believe that if men like the late Bishops of Oxford and London or Freeman had been willing to become candidates there would have been any likelihood of their being unsuccessful. Like Thorold Rogers, whom I often urged to allow himself to be proposed, they may not have desired admission.

W. T. THISELTON-DYER.
Kew, May 6.

The Spectra of Carbon Monoxide and Silicon Compounds.

A PAPER published by Prof. Hartley (*Proc. Roy. Soc.* vol. lxxviii. pp. 109-112, March, 1901) reminds me of some observations on the spectra of the compounds of silicon with fluorine and hydrogen (SiF_4 and SiH_4), made by me several years ago and published in *Wiedemann's Annalen* (vol. xxi. pp. 427-437, 1884). As they seem to be not without some interest, and a definite explanation of them has, so far as I know, not been given till now, I may be permitted to give here a short account of the principal contents of my little paper.

A vacuum tube filled with SiF_4 and procured from Geissler Nachfolger, in Bonn, showed a spectrum of which the greatest part consisted in the well-developed band spectrum due to carbonic oxide, besides which there appeared the eight beautiful blue lines, or rather stripes, that seemed (at least then) to be characteristic of SiF_4 . Now there is nothing wonderful about the presence of traces of the carbonic oxide spectrum in a vacuum tube, as is well known, but in our case it was so predominant, as if one had not simply to deal with impurities, but on the contrary, as if it was the principal part of the phenomenon. Intending to clear up the circumstances, I tried to prepare vacuum tubes from which the presence of carbonaceous matter, as well as of air and moisture, were as much as possible excluded, and finally the SiF_4 gas was developed from a mixture of pure glass and flourspar powder and also purest sulphuric acid in an apparatus composed entirely of glass and sealed directly to a Toepler mercurial pump. All stop cocks and sliding pieces that want greasing were totally avoided. Nevertheless, the carbonic oxide spectrum remained in its very predominant position; at low pressures it was even present almost alone, as if one were working on a carbonic oxide tube containing some impurities due to silicon combinations. Sometimes, it is true, the carbonic oxide bands were less brilliant, and the blue stripes (belonging to SiF_4 ?) more prevailing, from what cause I do not know, but still the carbonic oxide spectrum always remained well visible. Perhaps it is worth mentioning that sometimes there were seen four additional lines situated more towards the violet end of the spectrum, and occasionally, also, some green ones. Also the well-known swan spectrum could be obtained, especially when the discharges of a Leyden jar were sent through the vacuum tube. Even tubes illuminated in the well-known manner without the use of electrodes still showed the carbonic oxide spectrum in its predominant position. If some traces of oxygen had been developed from moisture, which, as is well known, it is almost impossible to totally remove from the glass apparatus used, and this had, by combining with some carbonaceous compound present in the tube given rise to some traces of carbonic oxide, then one could, so far as I know, only have expected a rather faint spectrum due to it. I do not know if the suggestion of carbon being contained in the element silicon is at all acceptable, according to present knowledge, but at all events the brilliant appearance of the CO bands awaits, as I believe, a sufficient explanation.

In a rather high vacuum this CO spectrum is not seen, but there are visible (except lines due to mercury, hydrogen, &c.) some lines also observable in highly exhausted tubes filled with carbonaceous compounds, but which, as I found in the latter case, only appear when luminous points are seen at the electrodes and the glass covers that partially surround them. As I found those lines to coincide with lines observed in the spark spectrum of SiF_4 at high pressures, this so-called vacuum spectrum probably belongs to some silicious matter evolved out of the above-mentioned glass covers by the action of the said bright points.

Under suitable conditions SiH_4 also showed the carbonic oxide and swan spectrum, and as well the one ascribed to hydrogen, this latter especially being seen at lower pressures, whilst of a silicon spectrum nothing was observable. Only at higher pressures, by the aid of spark discharges, some of the lines were obtained that had been seen formerly in the spark spectrum of SiF_4 .