confidence that the appeal will be widely responded to. We would point out that it is not only the large gifts of the wealthy that are sought, though they are no doubt essential to the success of the scheme, but also the smaller tributes of esteem, the thank-offerings of those who recognise that every household in the land is a debtor to the great man who has passed from amongst us.

Donations should be sent to the treasurers of the Lister Memorial Fund, Royal Society, Burlington House, W.

M. LECOQ DE BOISBAUDRAN.[1]

IN the death of M. Lecoq de Boisbaudran, which took place in May of the present year, there passed from the field of activity one of the most brilliant and energetic of French investigators. Lecoq de Boisbaudran was an amateur in the true sense of the word, and he had the faculty of concentrating the whole of his energy upon the question of the moment. He was born in Cognac in 1838. His parents were of noble family in Poitou, but their circumstances prevented his receiving more than an ordinary education. While a young man, he studied mathematics under his uncle, who had been a student at l'École Polytechnique, but his interest quickly became absorbed in the science of chemistry; he eventually succeeded in gaining an entrance to the laboratory of Würtz at l'École de Médecine, and it was here that he made the discovery of the element gallium.

Among his earlier contributions to science are papers on gravitation, meteorological phenomena, and also upon matters connected with agriculture; but physical chemistry and spectroscopy received the greater share of his attention. The probable existence of gallium had bee foretold by Mendeléeff, who had proposed the name *eka-aluminium*, but to Lecoq de Boisbaudran belongs the honour of the discovery and the isolation of the element. In the field of spectroscopic research his name may be classed with those of Kirchhoff, Bunsen, Sir G. G. Stokes, and Sir William Crookes, as one of the founders of the science of spectro-chemistry. His "Spectres Lumineux," published in 1874, was one of the most perfect works on spectroscopy at that time, and it possesses considerable value even at the present day; although limited to the visible region, the drawings are marvellously exact, and in the index wave-lengths of all the lines in the fifty-six spectra shown are given in Angström units to one place of decimals; the labour involved in the work was enormous.

At the time when Lecoq de Boisbaudran was in the prime of his scientific activity, the chemistry f the rare earths was receiving considerable attention. Clève of Upsala, Marignac, Demarcay, Crookes and others were hard at work in that very interesting field of research, and he devoted himself with all the energy of his nature to the work; during the period from 1880 to 1900 his communications to the Academy appeared in almost every issue of the *Comptes rendus*. He was successful in discovering and isolating the elements samarium and dysprosium, and he very completely investigated the body now known as gadolinium, which had been provisionally named Y α by Marignac.

In his earlier investigations he depended largely upon the indications given by the *spark spectrum*, produced by passing an alternating spark between electrodes immersed in a solution of the salts, and also upon the absorption spectrum of the solution; the spectra of didymium, erbium, holmium, &c., were very fully examined by this latter method.

At the time when the work of Sir William Crookes upon the kathode phosphorescence spectrum of the rare earths was published, he made the observation that if the condensed spark from one electrode was allowed to strike upon the surface of a liquid containing a rare earth salt, there was produced, just where the discharge struck, a faint luminous spot, which, when examined with a spectroscope of low power, gave rise to a series of faintly luminous bands, closely resembling the phosphorescent bands of Crookes; this he called the *reversal* spectrum, and the method of investigation was largely used by him in his speculations upon the constitution of the yttria earths. His conclusions in this particular were in direct opposition to those of Crookes, who, as the result of an extended series of observations on the brilliant bands produced by kathode phosphorescence, had suggested that the element yttrium was composed of a number of very closely allied bodies, which he termed *meta-elements*, each producing a distinct phosphorescent spectrum. M. de Boisbaudran, on the other hand, held the opinion that yttria, when perfectly pure, did not phosphoresce under kathode rays, and that the bands observed by Crookes were due to impurities contained in the yttria.

The origin of the band-producing earths is by no means clear even at the present day, but the fact remains that although much work has been since done upon the element yttria, no one has succeeded in producing the non-phosphorescing material of Lecoq de Boisbaudran. It is a great misfortune that the numerous researches of Lecoq de Boisbaudran, particularly those referring to the rare earths, have not been collected together and published in complete form; there are probably few of the rare earth elements about which some observation could not be found under his name; but, scattered as they are in isolated papers, they are in large measure lost, and probably many of his original observations will have to be re-made by his successors. This, unfortunately, was characteristic of the man. His method was to work and publish almost simultaneously; so engrossed was he in his work that he cared little for public recognition.

The cross of the Legion of Honour was conferred upon him for his discovery of the element gallium, but he never officially received the Order.

[1] An article from the pen of M. G. Urbain upon the life and work of Lecoq de Boisbaudran appeared in the *Revue Générale des Sciences* for September 15, and to that the present writer is indebted for several particulars not otherwise available.

He was awarded the Bordin prize in 1872, and was made correspondent of the chemical section in 1878. He received the Davy Medal of the Royal Society in 1879, and the Lacaze prize in 1880.

He died, after a painful illness, on May 28, at the age of seventy-four years.

J. H. GARDINER.

NOTES.

IN our issue of April 18 last (vol. lxxxix., p. 172) the announcement was made of the appointment of a Royal Commission to inquire into and report upon the natural resources of the Empire. On that occasion it was not possible to give the names of the Commissioners, but we are now able to say that the Commissioners originally appointed were as follows:—Lord Inchcape, Sir Edgar Vincent, K.C.M.G., Lieut.-Colonel Sir C. J. Owens, Sir H. Rider Haggard, Mr. T. Garnett, Mr. W. Lorimer, the Hon. G. E. Foster, Mr. D. Campbell, Sir Joseph G. Ward, Bart., Sir David Pieter de Villiers Graaf, Bart., and the Hon. E. R. Bowring. Some changes have taken place in the composition of the Commission since it was appointed, but neither originally nor now, so far as we can find, does the Commission include a single member prominently associated with some branch of scientific knowledge. This is the more surprising because it may be remembered that in March last, a month before the Royal Commission was appointed, the British Science Guild issued a report prepared by one of its committees, under the chairmanship of Sir William Ramsay, K.C.B., F.R.S., on the question of the conservation of natural sources of energy. The British Science Guild committee was composed almost entirely of expert men of science, who had given particular attention to the study of the questions with which the Royal Commission is dealing; and it is greatly to be deplored that one or more of their number, or other representatives of pure or applied science, have not been appointed members of the Commission.

THE recent publication of the "Life and Scientific Work" of Prof. Tait, of Edinburgh, reviewed in NATURE of July 13, 1911, has reawakened a desire on the part of his many old students and friends to have a worthy memorial of the "great natural philosopher." The proposal is to found a second chair of natural philosophy in Edinburgh, to be called the Tait chair, and a strong appeal for contributions towards an endowment fund has been issued by a representative committee. Accompanying the appeal there is a fine tribute on Tait and his work from the pen of Prof. Peddie, of Dundee, one of Tait's former assistants. There is also an interesting statement on the need of a second chair, in which Prof. MacGregor shows that, in comparison with other universities which have approximately the same number of students, the University of Edinburgh is far behind as regards the numerical strength of its teaching staff in experimental and mathematical physics. As early as 1872, Tait himself, in an article in *Macmillan's Magazine*, lamented the understaffing of the Scottish universities, giving it as his opinion that there should be 'a professor of applied mathematics in each, and a professor of experimental physics, in place of the present solitary professor of the enormous subject of natural philosophy." This is the ideal which the committee has set before it, and for the realisation of which it has appealed to a wide public. In the days of his activity Tait was a frequent and much-valued contributor to the columns of NATURE, and in the interests of the higher development of physical and mathematical science, we have much pleasure in directing the attention of our readers to this great and worthy object. The honorary treasurer of the fund is Sir George M. Paul, 16 St. Andrews Square, Edinburgh.

THE dinner given by the Fishmongers' Company on October 24 to a distinguished company, "to meet the President of the Royal Society," may well be taken as an indication of the esteem in which scientific work is held by a great City company. The assembly invited included representatives of numerous branches of science, among whom were many members of the Royal Society. The following scientific societies, for instance, were represented:—The Royal Horticultural Society, the British Science Guild, the Society of Antiquaries, the Royal Astronomical Society, the Institution of Civil Engineers, the Linnean Society, the Geological Society, the Royal Microscopical Society, the Chemical Society, the Entomological Society, and the Surveyors' Institution. Sir Archibald Geikie, in responding to the toast of "The Learned Societies," proposed by the Prime Warden, said that the City guilds have played an important part in the history of London. The learned societies, too, have had close relations with the City companies. The Clothworkers' Company has had two distinguished masters who have been presidents of the Royal Society—Samuel Pepys and Lord Kelvin. The City guilds, too, have shown great diligence in the application of their funds for educational and scientific purposes.

AN account of certain red bands observed by Profs. Breuil and Sollas in Bacon's Hole, on the Gower peninsula, and apparently of prehistoric origin, appeared in NATURE of October 17 (p. 195). According to *The Cambria Daily Leader* of October 18, the markings were made by a Mumbles boatman eighteen years ago, and were produced with a brush having red paint upon it, which was part of the salvage from the wreck of a Norwegian barque. Several other explanations have since been put forward, and are referred to in a short article in Tuesday's *Times*. Whether the markings are of ancient or modern origin does not appear yet to have been decided definitely, but the position of the question is shown by the following extract from *The Times* article:—"When they observed the marks the first question which presented itself to Prof. Breuil and Prof. Sollas was: 'Are they ancient or modern?' Prof. Breuil, having wetted the surface, attempted to remove the paint by vigorous rubbing; not succeeding in this, he concluded they were ancient. Prof. Sollas closely examined the wall to see whether the paint was covered by stalactite, and convinced himself that it was. To reassure himself on this point Prof. Sollas has lately revisited the cave. He was able with a hammer and chisel to detach a