the progress of natural history in this country and the evolution of the collections in the Museum which it would be very difficult, or impossible, to obtain elsewhere. Despite a lamentable loss of early collections, like those formed during Cook's voyages, owing to lack of knowledge of their value and indifferent curatorship, the Museum is particularly rich in type-specimens, more especially of species presenting well-marked characteristics of their own. In many cases particular attention is directed to these and other specially interesting specimens in the collection, although in these matters, again, a great diversity of treatment is noticeable in the different accounts.

Science and Religion. By the Rev. Lord William Gascoyne Cecil. Pp. 105. (London: Hodder and Stoughton, 1906.) Price 3s. 6d. net.

FIVE addresses delivered in substance at St. Lawrence Jewry during Lent, together with an explanatory foreword, make up the contents of this volume. The author lays claim to "no scientific qualifications at all," and therefore "can only speak as one of the crowd," to use his own description of himself. The sermons follow lines which are already familiar to students of science acquainted with the literature which has grown up round the attempt to "reconcile" traditional theology with results of scientific study.

How to Learn on Shore the Rule of the Road at Sea. By E. W. Owens. Pp. 40+23. (London: George Philip and Son, Ltd., 1906.) Price 3s. 6d. net.

THIS excellent little book meets a great want, and is strongly recommended for use in all training schools and ships. It is arranged in a convenient manner, and the explanations are simple and good. Part ii., which consists of extracts from the Merchant Shipping Act and the latest regulations for preventing collisions at sea, special lights for fishing craft, &c., makes the book not only useful in the class-room, but a great convenience on the bridge of any ship as an *aide mémoire*. H. C. LOCKYER.

LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

Absorption of the Inert Gases by Charcoal.

It may interest some of your readers to know that Prof. Rutherford, in a private letter addressed to myself, has given a full explanation of the circumstances that led him to infer that the absorption of the inert gases by charcoal was exceptional. Fully appreciating the difficulties that beset Prof. Rutherford at the time he wrote the letter to NATURE (vol. lxxiv., p. 634, October 25), I exonerate him from all blame in the matter, and willingly cancel all the expressions of regret he has been pleased to make.

With regard to the latent heat question, I ought to mention that Prof. Rutherford will not commit himself to the view that the electrometer readings recorded in the paper I quoted are proportional to the partial pressures of the emanation. He says:—"I do not know how far the electrometer readings may be taken as a measure of the partial pressures of the emanation, but naturally measurements over a range of temperature of 1° or 2° cannot be vouched for with any certainty." This would be a strong criticism provided any manometric measurements had been attempted, but if the electrometer measures directly the relative concentration of the emanation in a given volume of gas, the method is so sensitive that the increase caused by a narrow range of temperature is less liable to error. It is clear, however, that new determinations will have to be made before the question can be settled.

In the meantime, I can only wish Prof. Rutherford success in the applications of charcoal to the study of the emanations of radio-active bodies, and take the opportunity of expressing my gratification at seeing charcoal becoming of such scientific utility in the hands of workers like the Hon. R. J. Strutt, the French chemists Moureu and Biquard, not to mention others: the more especially as my own labours have been interrupted for reasons given in my former communication.

JAMES DEWAR.

Royal Institution, 21 Albemarle Street.

Radium, Actinium, and Helium.

IN NATURE of November 29 Dr. B. Walter discusses the theory of Prof. Rutherford that in radio-active change accompanied by the emission of an α particle the atomic weight is diminished by 4, the atomic weight of helium. According to this assumption, the transformation of uranium (238.5) into radium (226) is due to the loss of three helium atoms. Now uranium gives one α particle in changing to uranium X, so that only two such changes remain for any subsequent transformations. If we accept the result of Profs. Moore and Schuldt (*Phil. Mag.*, October) that uranium X gives out α rays, two changes are accounted for, and only one is left for intermediate products.

In NATURE of November 15 Mr. Boltwood brings forward experimental evidence in support of the view that actinium is an intermediate product between uranium and radium; but in the case of actinium and its derivatives four changes, accompanied by the emission of α particles, occur. Thus, on the assumption that the α particle is a helium atom, there is no room for these products.

The difficulty can be removed by adopting another alternative, suggested by Prof. Rutherford, that the α particle is one-half of the helium atom carrying a single ionic charge (*Phil. Mag.*, p. 366, October). In this case we should have the following series possible:—

Series I.	Series II.
Uranium (238.5)— α	Uranium (238.5)— α
Uranium X (236.5)— α, β, γ	Uranium X (236.5)— α, β, γ
Actinium (234.5)	Unknown (234.5)— α
Radio-actinium (234.5)— α	Actinium (232.5)
Actinium X (232.5)— α	Radio-actinium (232.5)— α
Actinium emanation (230.5)— α	Actinium X (230.5)— α
Actinium A (228.5)	Actinium emanation (228.5)— α
Actinium B (228.5)— α, β, γ	Actinium A (226.5)
Unknown (226.5)— α	Actinium B (226.5)— α, β, γ
Radium (224.5)	Radium (224.5)

If the atomic weight of radium were 226.5, the unknown change accompanied by the expulsion of an α particle must be removed from the series. One or more rayless changes may also occur.

It is interesting to note that the atomic weight of actinium, according to Series II., comes out as 232.5, that is, exactly the atomic weight of thorium. These two substances closely resemble one another in their radio-active properties, giving transformation products of very similar character. This suggests as an analogous case the similarity between nickel and cobalt, two elements of practically the same atomic weight.

H. S. ALLEN.

King's College, London, November 30.

Mira Ceti.

It may be well to note that this variable star is exceptionally bright at its present maximum, the magnitude being about 2.0. As usual when the star is bright, it is less red than its average.

T. W. BACKHOUSE.

West Hendon House, Sunderland, December 1.