An Explanation of the Adjustment of Ships' Compasses. By Commander L. W. P. Chetwynd, R.N. Pp. 24. (London: J. D. Potter, 1909.) Price 2*s*.

THIS useful little book, the sections of which are accompanied by diagrams, is an endeavour on the part of the author to convey to the reader in as concise a manner as possible the various causes of deviation, and the methods of overcoming them, without the use of mathematical formulæ.

In most treatises dealing with this subject it is, unfortunately, the case that they are too theoretical and contain too many symbols to suit the average seaman; therefore great praise is due to Commander Chetwynd for the able manner in which he has brought out a practical book for practical people. H. C. L.

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.*]

An Inquiry concerning Scientific and Medical Journals.

CAN any of your readers kindly inform me where copies of the following journals can be found in England, if possible in London?

(*a*) *Lo Spallanzani.* This is a journal of the medical and natural sciences published at Modena in the 'seventies and 'eighties.

(*b*) *Mittheilungen d. Wiener embryol. Institut.* Published in the 'eighties, and perhaps still.

(*c*) *Gazette médicale d'Algérie.* Published at Algiers in the 'fifties.

(*d*) *Ann. Soc. méd. d'Émulation de la Flandre occid.* Roulers, 1849. There are other references to a *Soc. méd. d'Émulation*, without place or name. I should be very glad to have these *Soc. méd. d'Émulation* cleared up, as there must, I think, have been several such societies.

(*e*) *Baltimore Sun*, 1876. The stock of this journal was burnt. Is there a file of it anywhere in England?

(*f*) *Archiv de méd. nav.* Published at Paris in the 'seventies.

(*g*) *Archiv f. Psych. u. Nervenkrankheiten*, for the 'eighties.

(*h*) *Sociedad medica Argentina*, 1901.

(*i*) *International Med. Magazine.* Philadelphia, 1892.

(*j*) *Zeitschrift f. Tiermedicin*, 1897. (Sought at Royal Veterinary College.)

(*k*) *Soc. med. Württemberg*, 1905.

These have been sought for at the likely places, but it is possible that they exist and have been overlooked. It is a pity that some of the larger libraries in London duplicate certain of the *rarer* scientific and medical journals, whereas by a division of material they might provide a more comprehensive collection. Further, there ought to be at least one library in London with a complete set of university dissertations and degree theses. No library at present appears to make a speciality of such material. I have always found German university librarians most willing to lend copies, but the delay is vexatious, and a cursory examination of five minutes' duration would often have settled the point required. KARL PEARSON.

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Radio-activity in Relation to Morozoff's Theory of the Constitution of Atoms.

THE fact that the α particles of radium, as shown lately by Prof. Rutherford and Geiger,[1] carry two elementary charges of positive electricity, $2\times4{\cdot}65\times10^{-10}$ E.S.U. per atom of helium, appears quite unexpected, and requires consideration. Since the atom of helium carries more than a single charge, which would present the simplest and most natural contingency, there arises the question, Why does it carry just two charges and not one or more? an answer to which has been proposed by N. L. Müller in the "Jahrbuch der Radioaktivität" (v., 702, 1908), but it seems to me that the following explanation, based upon the Morozoff theory of the constitution of atoms,[1] will not be devoid of interest.

[1] Proc. Roy. Soc., lxxxi., 162 (1908), and *Physikalische Zeitschrift*, x., 42 (1909). Also NATURE, November 5, 1908.

According to Morozoff, all the chemical elements are formed by manifold combinations of three primordial elements, viz. archonium (nebulium) (Z), with a combining weight 4; protohelium (x), with a combining weight 2; and protohydrogen (h), with a combining weight 1. Of these, protohelium, as shown by the value of its combining weight, presents half an atom of ordinary helium, the re-combination of two of which yields again a helium atom.

Archonium (Z), with its eight affinities, plays the part of carbon in organic compounds, the archonium elements, more or less saturated with protohelium (x) and protohydrogen (h), building the main atomic chain. The chains of various chemical elements are built of one to eleven such links, which, combined after certain rules, allow us to reconstitute the whole periodic system of elements.

As in the notation of organic chemistry, the atom of radium is represented in Morozoff's system by the following symbol:—

$$x-\mathrm{Z}(x_2h)-[\mathrm{Z}(xh)_6]_9-(x_2h)\mathrm{Z}-x.$$

Radio-activity is due to closing of the chain, accompanied by splitting off of two helium half-atoms (x),

$$\underbrace{\mathrm{Z}(x_2h)-[\mathrm{Z}(xh)_6]_9-(x_2h)\mathrm{Z}}+2x.$$

which yield the material carriers of electricity of the α particles.

Since both extreme helium half-atoms (x) are expelled under similar conditions, and since they carry electricity, each of them cannot carry less than one elementary charge of $4{\cdot}65\times10^{-10}$ E.S.U., hence a whole atom of helium must carry at least two elementary electric charges, or $9{\cdot}3\times10^{-10}$ E.S.U.

As not only radium, but also thorium and uranium, are represented by similar symbols, and their radio-activity is always accompanied by the expulsion of two helium half-atoms, it is evident that in all known radio-active changes an atom of expelled helium must carry at least two elementary charges. If we call, further, as has been done by Maxwell, an elementary charge an atom of electricity, we can consider the combination of two of them as a molecule of electricity, and state the following general law:—in all radio-active changes the smallest quantity of electricity associated with an atom of matter is not an atom ($4{\cdot}65\times10^{-10}$), but a molecule of electricity ($9{\cdot}3\times10^{-10}$). B. DE SZYSZKOWSKI.

Kieff, Zolotoworotska 6, Russia, April 16.

The Gravitative Strain upon the Moon.

IN his discourse on "The Æther of Space" at the Royal Institution, February 21, 1908 (abstracted in NATURE, vol. lxxix., p. 323), Sir Oliver J. Lodge states that "the force with which the moon is held in its orbit would be great enough to tear asunder a steel rod four hundred miles thick, with a tenacity of thirty tons per square inch," and he further states that Maxwell calculated the gravitational stress near the earth to be 3000 times that which the strongest steel could stand, and near the sun it should be 2500 times as strong as that.

For convenience we may call the diameters of the earth and of the moon 8000 and 2160 miles respectively, and the moon's distance from the earth 240,000 miles. At the surface of the earth the moon would fall 16·1 feet, or 1/328 mile, in one second. The velocity necessary to counteract this fall is, therefore, equal to $\sqrt{8000\times1/328}$, or about five miles per second, at which velocity the centrifugal force of the moon, revolving at a distance of

[1] *Physical Review* (Russian), ix., 73, 121 (1908).