

to be found in works on this subject, because the time and expense involved in visiting personally all the spas of Europe is very great, and few physicians are able to accomplish such a feat.

Domestic Science Readers. By Vincent T. Murché. Book iii. Pp. 176. (London: Macmillan and Co., 1896.)

IN the subject of domestic economy, for Standard III., the Education Department require knowledge of the chief materials used in clothing and washing, *e.g.* silk, linen, wool, cotton, fur, leather, and washing materials. This book supplies that knowledge in a form attractive to juvenile minds. The children who read the book will acquire useful information in an easy manner.

The Story of Electricity. By John Munro. Pp. 194. (London: George Newnes, Ltd., 1896.)

A SIMPLE and accurate story, containing brief but clear descriptions of the principles and applications of electrical science. The book will educate the public in the knowledge of the great achievements of electricity, and will create an interest in scientific things.

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.]

Zoological Publications.

WHEN the rules for zoological nomenclature are next under discussion, it might be advisable to include a clause relative to the discretion of editors in dealing with authors' contributions to scientific journals.

My paper (*Journal of the Linnean Society*, xxv. p. 325), before publication, was entitled "The Egg-case of Port Jackson Sharks," and it was presumed that the Port Jackson sharks, popularly so known, would be thereby understood.

As the length of time occupied by postal transit to and from London might unnecessarily delay publication, I did not ask for a proof. On receiving my copy of the *Journal*, I found that the title was altered to "On the Egg-cases of some Port Jackson Sharks;" thus the purport of the title was destroyed. Perhaps this is a small matter. One affecting me more nearly is the substitution of the name "*Cestracion*" for *Heterodontus*, which I used.

Heterodontus may be right or it may be wrong; but, as author of the paper, having adopted that name, I submit that it should have been retained. At the same time, there could be small objection to an editorial foot-note. EDGAR R. WAITE.

Australian Museum, Sydney, April 28.

THE appellation "Port Jackson Shark" is customarily applied to *Cestracion philippi*. Macleay, as is well known, doubted the justice of including in this species the Japanese *Heterodontus zebra* (Gray); and as Mr. Waite, admitting the independence of the latter species, extends the vernacular name to *C. galeatus*, the alteration in the title of his paper is regrettable, though not serious. It was made without my sanction, and I am sorry to say that it escaped my notice in the performance of my editorial duties. Had I detected it, I should not have allowed it to pass.

Concerning the substitution of *Cestracion* for *Heterodontus*, I would point out that although the latter name has priority by a year, no recent writers but Macleay and Macleay, so far as I am aware, have allowed it to stand; and that even were this not so, *Heterodontus* (1816) on the strict rules of priority in nomenclature is preoccupied by *Heterodon*, applied by Latreille to a snake in 1800.

When Mr. Waite's paper came before the Council of this Society, the matter was carefully considered, and, in accordance

with instructions, I wrote him to the above effect, pointing out that I should substitute *Cestracion* for *Heterodontus* unless I heard from him to the contrary during the passage of his paper through the press. My letter was written early in July 1895, and the paper was published last February, ample time being thus allowed its author in which to reply. To this day no reply has been received. G. B. HOWES.

Linnean Society, London, June 19.

The Salaries of Science Demonstrators.

WILL you allow me to protest in your columns against what is nothing less than a public scandal, namely the advertisement by a University College, in your last issue, for a Demonstrator of Chemistry at a salary of £70 per annum?

A science demonstrator at a University College is, or should be, in some sense "a scholar and a gentleman"; and how, I ask, is a man of that type to support a decent existence on such a salary? The effect of this policy of accepting the lowest tender will be either to close such posts to those not possessed of private means—a result utterly at variance with the spirit of the time, and destructive of true efficiency—or to fill them with men of an inferior class, which would be no less harmful to the quality of our scientific education. Have we not a right to expect a more enlightened policy from the governing bodies of our University Colleges? Surely they must see that the haggling of the market does not afford the best means of fixing a teacher's reward. Even the general public cannot but recognise it to be in its own interest, that those who are chosen to educate its sons should be men of as deep knowledge and as wide culture as possible. And what width of culture and depth of knowledge can be attained on £70 a year, with the day fully occupied in the routine work of teaching, the general public itself can judge. Demonstrators of chemistry have, too, I think, peculiar cause for complaint; as a rule their duties are heavier than those of other science demonstrators, whilst their salary is the same.

In these days, even the miner has his minimum wage: cannot one be fixed for science demonstrators? It should not be less than £150, I think; certainly anything under £100 is scandalous, even in the present state of public opinion.

CHARLES FREDERIC BAKER.

Halley's Chart of Magnetic Declinations.

WITHIN the last few days I have come into possession of another early map showing Halley's lines. The date of this map is 1725, and it was published by John Senex, F.R.S. It is entitled "A Map of the World, corrected from the Observations communicated to the Royal Society of London and Paris." The map consists of the two hemispheres, each of which is 21 inches in diameter. Around the margin in small print is Sir Isaac Newton's "Theory of the Tides," and "An attempt to Assigne the Physical Cause of the Trade Winds and Monsoons, by Dr. Ed. Halley." The map is particularly interesting, as it was evidently intended to give a full account of the winds, the directions of which in the trade winds and monsoons are indicated by arrows. Another interesting note in the margin is "Of the quantity of Vapour exhaled from the Sea, of its Circulation, and of the Cause of Springs," "Extracted from a Discourse published in the Philosoph. Transact., No. 189, 192. Writ by Dr. Ed. Halley." What makes the map so interesting is the notes printed upon it referring to the magnetic declinations. The lines of magnetic variation for every 5° east and west of the line of no variation, are given in the Atlantic and Indian Oceans, but not in the Pacific.

The line of no variation is described as "The line of no variation in the year 1700." The following note is printed upon the Atlantic Ocean between the Azores and Cape Verd Isles. "These curve lines wch express y^e variation of y^e magnetical needle ware observed by Dr Edmond Halley for y^e year 1700, but it must be noted that there is a perpetual tho' slow change in the variation almost everywhere (viz.) about C. Bona Esperanza y^e W. variation increases about a Deg. in 9 years, in our Channel a Deg. in 7 years, on y^e Guinea Coast a Degree in 11 or 12 years, on y^e American side y^e W. variation alters but little: and y^e East variation on y^e S. America decreases y^e more Southerly y^e faster; y^e L. of no variation moving

gradually towards it." In the South of the Pacific Ocean called the Great South Sea or Mar del Zur is the following note. "The Line of no Variation y^c passes near y^c coast of China divides again y^c West from y^c East variations y^c in all probability is to be met with almost all over this Immense Ocean; but have not attempted to describe the Curves therein wanting accounts and journals to ascertain the same." The line of no variation referred to in this note is marked on the map as passing to the west of Van Diemens Land—through New Holland and the East Indian Islands to China, and thence through China to the north of Pekin. In the Indian Ocean, just north of the Antarctic Circle, is the following note. "By the Variation of the Magnetical Needle or Mariners Compass is meant its deflection from the true Meridian, for it has been observed that there are but few places where its direction is true North but varies therefrom either to y^c Eastward or Westward in some places more in others less. Now this variation is of that great concernment in the Art of Navigation that the neglect thereof does little less than render useless one of the noblest Inventions Mankind ever yet attained to, for which reason we have here inserted them as they were found by Dr Halley in y^c year 1700. The Curve Line passing over those places whose degrees of variation are superscribed."

The map is dedicated to the Right Honourable Richard Boyle, Earl of Burlington and Cork, &c., by John Senex, by whom it was drawn and engraved. It was "sold by J. Senex at the Globe against St. Dunstan's Church in Fleet Street, London, 1725." THOS. WARD.

Northwich, June 13.

P.S.—I have just discovered the following note in the Indian Ocean to the South of Madagascar. "In this Indian or Eastern Ocean after you pass Madagascar y^c Westerly Variation was in y^c year 1700 on y^c decrease y^c faster y^c more Westerly and Southerly, and it was then in a manner at a stand when you came to the length of Java."

THE TOTAL ECLIPSE OF THE SUN.

THE following suggestions were compiled for a special purpose. As it is probable that many amateurs will take advantage of the coming occasion to observe the various phenomena, the suggestions are published here in the hope that they may prove useful to some who are witnessing a total eclipse for the first time.

J. NORMAN LOCKYER.

(1) Time Observations.

Observers who are supplied with a first-rate chronometer, of which the error and rate are known, may make valuable observations of the four contacts.

For the first contact a telescope is necessary to observe the first small encroachment of the moon on the sun's limb; of course, if a spectroscope is used to observe the gradual eclipse of the chromosphere indicated by the gradual shortening of one of the lines of hydrogen (C for choice), so much the better, but care must be taken by sweeping along the limb to secure that the chromosphere immediately above the first contact is under observation; here, of course, the line will be shortest.

The second contact will be heralded by the sweep of the moon's shadow through the air. Mr. Crommelin has calculated that in Norway this will move at the rate of two miles a second; the shadow on the land- or sea-scape will, of course, be best seen from the most elevated stations.

To observe the exact time of contact, a green shade should be used, as the disappearance of the white light of the photosphere and the appearance of the red light of the chromosphere will be emphasised. Prof. Harkness has also pointed out that the exact moment of second contact is also clearly indicated by the "seemingly miraculous appearance of the complete outline of the moon, round and black, reposing upon the wondrous radiance of the corona."

The approach of the third contact is indicated by the rapid brightening of the chromosphere at the point of the moon's limb where the sun is about to reappear. The green shade should again be used, and two or three seconds later a fine cusp of photosphere will make its appearance, announcing the termination of totality.

The green shade is here especially useful, as often the reappearance of the lower brighter chromospheric level has been mistaken for the reappearance of the sun itself.

For the fourth contact a telescope should be used if possible, otherwise a smoked glass.

It is desirable that, if possible, each party observing the contacts should consist of three persons; one to watch, without any interruption whatever, the face of the chronometer and to count the seconds immediately before each contact is expected, another to make the observation, and another to record the exact time, minute, second, and part of second at which the signal is given by the second observer.

(2) Disc Observations.

These observations are for noting the greatest extent of the corona, and can only be made by shore parties.

Calculate the altitude and azimuth of sun's centre, at place, at mid-eclipse. Make a disc of such a size that at a distance from the eye of 20, 30, or 40 feet, as may be decided on, it will cover the sun, and extend three minutes of arc beyond the limb all round.

Erect this on a vertical pole, so that from the chosen observing point it will eclipse the dark moon and the lower parts of the corona (3' high) at mid-eclipse.

A hole should be cut in a piece of wood or cardboard, fixed at the proper height, to show the exact position of the eye. This should be free to move in altitude and azimuth to secure exact adjustment.

Test the accuracy of everything, if possible, the day before at the time the sun is nearest the mid-eclipse position.

Before totality one observer should make the adjustments before referred to, and should see that at ten seconds after the beginning of totality the lower part of the corona all round the dark moon is completely covered by the disc.

Another observer, whose eye has been lightly bandaged to make it as sensitive to faint light as possible, should then be placed at the eye-hole, and should look for the faintest extensions. He should dictate to an amanuensis the length of extensions in diameters of dark moon; and their bearing, the vertex representing magnetic north.

Immediately the totality is over, the actual observer should draw what he has seen on a card similar to that used by the sketchers of the corona (see later). This drawing should include everything seen, but the extensions should be noted with the greatest care.¹

(3) Eye Observations of the Corona.

All can do serviceable work by sketching very carefully the corona during the time of totality. The observers should provide themselves with a card (or cards) one foot square, on which a circle two inches in diameter is drawn in ink, and darkened to represent the moon's disc. The diameter will serve as a scale, so that the distance the boundaries and rays of the corona extend from the dark moon may be carefully noted. Imagine both the dark moon and dark disc to represent a compass card, then the various details may be sketched at their appropriate bearings, the top of the card representing mag. N. (The points may be marked on the card in any detail that may be required, but eight should suffice.)

These observations should, if possible, be made by

¹ For phenomena thus observed in eclipse of 1878, see "Lockyer's Astronomy," p. 115.