

treatise on the oyster, and an account of experiments on oyster culture, which we have not space to discuss in the present number.

OUR BOOK SHELF

Wanderings South and East. By Walter Coote. Maps and Illustrations. (London: Sampson Low and Co., 1882.)

Pioneering in the Far East, and Journeyings to California in 1849, and the White Sea in 1878. By Ludwig Verner Helms. Illustrations. (London: Allen and Co., 1882.)

ALTHOUGH these two volumes cover a very wide field, neither of them can be said to break on new ground. Mr. Coote does not profess to be much more than a tourist, but as he tells the story of his wanderings pleasantly, and touched at a few places concerning which our information is scanty, he may be held to have sufficient excuse for bringing the record of his journey before the public. He spent some time in the Australian Colonies and Fiji, and visited Norfolk Island. His wanderings further embraced the Hawaiian Islands, the New Hebrides, the Banks and Torres Islands, the Santa Cruz and Solomon Islands, New Caledonia and the Loyalty Group. China and Japan, and Central and South America were also embraced in his extensive tour. Mr. Coote is a good observer, and the information he gives concerning what he saw in the less frequented islands, the New Hebrides, the Santa Cruz, Solomon and Loyalty Islands, is a welcome addition to existing knowledge. He is chiefly interested in the people, habits, houses, implements, and weapons, and therefore the ethnologist may find something in his volume that will be of service. The illustrations are good, and the volume as a whole is extremely pleasant reading.

Mr. Helms is an old traveller, and most of his volume takes us back about thirty years ago. He spent considerable time in Bali and Borneo, where he took a prominent part in the events connected with Rajah Brooke; visited Cambodia and Siam, China and Japan, and spent some little time in California during the height of the gold fever. He brings together much curious and interesting information about Bali and Borneo, especially at the time of his sojourn, the condition of the people, their manners and customs, the state of trade, &c. He gives a very vivid description of an instance of suttee which he witnessed. His account of what he saw in California is interesting, and he finishes off with the record of a visit to the White Sea, in connection with some mining operations. Altogether his book is quite worth reading.

Hölzel's Geographische Charakter-Bilder für Schule und Haus. Herausgegeben unter Pädagogischer und Wissenschaftlicher Leitung, Von Dr. Josef Chavanne, K. v. Haardt, V. Prausek, Prof. V. Marilaun, Dr. Fried. Simony, Dr. Fr. Toula, Dr. K. Zehden, &c. (Vienna: Edward Hölzel, 1882.)

WE have already referred, in connection with Hirt's Geographische Bildertafeln, to the comprehensive idea of geography entertained in Germany, and the admirable methods adapted for infusing into the teaching of the subject as much of reality as possible. For enabling the pupil to realise the features about which he reads in his text-books, we have never seen anything to equal the Charakter-Bilder which are being issued by Hölzel of Vienna, and edited by a large staff of some of the best teachers. These pictures are on a very large scale, are coloured by the oleographic process, and have all the appearance of good oil-paintings. Each picture is devoted to one subject, and measures something like $2\frac{1}{2}$ feet by 2 feet. The aim is evidently to illustrate the leading features of the earth's surface, and bring before the pupil the main characteristics of the different countries.

Nine of these pictures have already been published; their subjects are the Ortler Region, the Shoshone Cañons and Waterfalls of North America, the Gulf of Pozzuoli, the Sahara Desert, the Bernese Oberland (a double picture), the Rotomahana Region of New Zealand, the Sierra Nevada, the Eastern Border of the Anahuac Plateau. Thus, it will be seen, the subjects are very varied. To each picture there is a separate explanatory text, entering with somewhat minute detail into the characteristics of the region illustrated, its topographical features, geology, biology, &c.; the text being accompanied with wood engravings still further to help in the understanding of the subject. We need scarcely point out what an important help these pictures and their text must be in the study of geography, nor how admirably calculated they are to lead children to interest themselves in the subject. To the household library they would be an important addition, and even those who have long left school might turn them over with pleasure and profit. We should like to see them brought within the reach of English schools.

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. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.]

Researches on the Division of the Chlorophyll-Granules and upon the Occurrence of Hypochlorin in the Cyanophyceæ and Bacillariaceæ

I, IN the year 1881, made a considerable series of examinations of the division of the chlorophyll-granules of phanogamous and cryptogamous plants, and upon the occurrence of Pringsheim's hypochlorin in the lower algæ, especially in the order Bacillariaceæ and Cyanophyceæ (Phycchromaceæ). The investigations are in detail described in my paper, "A chlorophyll és a növényi sejtmag morfológiájához. Irta Schaarschmidt Gyula. Rajzokkal egy fotogrammon. Kolozsvárt, K. Papp Miklós örökösénél, 1881. 56 pp. 16°" (Contributions to the Morphology of the Chlorophyll and Vegetable Nucleus. With photograms. Kolozsvár, 1881, &c.), which is published in the Hungarian language. I take the liberty of briefly communicating the chief results, by way of insuring my priority.

I. The division of the chlorophyll-granules was discovered by Carl Nägeli in the year 1844. After him Milde, Wigand, Hofmeister, Rosanoff, Sachs, Kny, Strasburger, Velten, Haberlandt, Mikosch found that the chlorophyll-granules multiply by division in the lower and the higher plants. According to these authors, the granules are divided by a constriction in the middle; the green colouring-matter retires to the poles; consequently the protoplasmic isthmus between the daughter-granules is colourless. The new daughter-granules increase in size, until they become as large as their parent-granules. When detached, each divides again, and the process is repeated. But the process is, according to my observations not so simple. We find here an example of division that is very similar to the multiplication of the nucleus described and drawn by Hanstein, Strasburger, &c. The green colouring-matter retires before the division to the two poles of the oval-shaped granules, and in the middle a colourless band is thereby formed. In this state will be seen with powerful lenses (2000-3000 lin. magn.), and by careful preparation with alcohol, abs. and tincture of anilin, that in the protoplasmic isthmus small threads (filaments) are formed. The extremity of the threads is immediately fixed in the protoplasmic matter of the granules. If we examine the double granules, which are now lying detached at a little distance (united solidly by the threads), we see the threads between the daughter-granules expanded. This figure reminds us of the state of nucleus division called "cell-tun" (*Zell-Tonne*) by Strasburger. The new daughter-granules separate further and further; the threads are more and more extended, until the intervening space equals that occupied by two to three granules. During this time the inner portions, as they extend, develop more and more of the circle, until each becomes a perfect hemisphere. The