

We note the following misprints: On page 38, in the foot-note, the death of Admiral Bruix should be 1805 instead of 1802: this date fixes the composition of the book as having been before March 18, 1805 (see Preface, p. vi). On page 127, line 11, we should read "6th Pluviose." On page 141, line 4, "Moreau's" should evidently be "Bonaparte's"—a change of some importance.

Lectures on the Physiology of Plants. By Sydney Howard Vines, M.A. Cambridge, England: University Press; New York: Macmillan. 1886. Pp. 710. 8vo.

THE physiology of plants has made great progress of late years, and has, like other special studies, become not a little recondite and technical. Yet it would seem that what is known of the subject might be so expounded as to be fairly intelligible and generally interesting to those not of the craft. Dr. Vines, the Reader of Botany in the University of Cambridge and the Lecturer in his own college, has undertaken this desirable exposition in lectures to his classes; and the University Press, by printing these twenty-three lectures as worked over into book form, in a handsome and handy volume, has now given the general scientific or scientifically-minded reader easy access to the principles of vegetable physiology in their present aspect. The arrangement and the presentation are admirable, the style clear and good, and the book, unlike some translations from the German into English, may be read with satisfaction. It may be commended even to the higher order of our botanical teachers, not only as an excellent model, but also for fulness of information and clear indication of the actual lines of research. Each lecture, moreover, is supplemented by a select bibliography of the topic.

In his preface the author calls attention to a point in terminology about which he seems uncertain—as well he may—whether he has taken the right course, viz.: "the use of the terms dorsal and ventral in speaking of the positions taken up by dorsi-ventral organs. It is the general custom of those who have written on this subject to speak of the normally lower surface of the organ as the ventral, and of the upper as the dorsal. Morphologists, however, term the normally upper surface of dorsi-ventral leaves the ventral, and the lower the dorsal. I have adopted the former use of these terms," etc. Now, in the first place, we see no need or propriety in this new-fashioned term dorsi-ventral as applied to leaves and other horizontally expanded parts. For plants and their parts have neither back nor belly, front nor rear, their appendicular organs being disposed circularly round a central axis. And when erect or ascending instead of horizontal, the normally upper face of the leaf looks inward toward the common axis. It is to this inner (upper) surface, which (as above stated) all morphologists from the beginning of morphological botany till now have applied the term of ventral, and this use of dorsal and ventral is well fixed in botanical terminology. We know not who the writers are whom Dr. Vines follows in this literally preposterous view; nor do we apprehend the reason of it. A dog, indeed, or other quadruped presents its ventral aspect to the ground and its back to the sky; but a leaf is not a dog that it should do this thing rather than the contrary. If a leaf has any back, it is natural to call by that name the part which is external when the leaf closes, and which has a midrib for backbone. But, after all, the author gives away his case on p. 321, where he speaks of the "upper (ventral) surface of the leaf of *Dionaea*." Here, where the upper surface acts physiologically as stomach, it were too absurd to call it anything but ventral.

Krakatau. Par R. D. M. Verbeek, Ingénieur-en-chef des mines, Chevalier du Lion Néerlandais. Publié par ordre de Son Excellence le Gouverneur-Général des Indes Néerlandaises. Batavia: Imprimerie de l'État. 1886. 2 volumes, 8vo, pp. 104 and 567, with atlas of forty-three maps and diagrams and twenty-five large plates in color.

THIS admirable memoir treats of the island of Krakatau, a volcano lying in the strait between the islands of Sumatra and Java. It was the last eruption of this volcano which, in August, 1883, made it memorable in the history of the Indies and an object of peculiar interest to geologists and physicists; for it not only ravaged the shores of the neighboring islands, destroying the lives of nearly forty thousand people, but the shocks which it gave to the air and sea swept around the earth, and the vapors darkened the air of every land.

The first volume of M. Verbeek's great work treats of the island as it existed before August, 1883, and of the phenomena of a local kind attending the eruption. The second volume is devoted to a careful discussion of the scientific facts concerning the eruption, gathered from the whole field. Lying in the path of a great commerce, this island had been during three centuries one of the most constantly observed of volcanoes. Until 1883 it showed little signs of activity. Vogel, in 1680, probably saw a slight eruption from it, though of this there is some doubt. On the 20th of May, 1883, a vigorous but brief eruption began: it threw the column of cinders to the height of about thirty-three thousand feet, and covered the sea with floating pumice, but by the 23d the discharge appears to have become relatively slight. Eruptions not sufficient to prevent an exploration and survey of the little island occurred from day to day until August 26, on which date the great eruption began. This explosion lasted for about forty-eight hours, and was the most violent ever known. The sound of the outbursting gases was distinctly heard over a circle about three thousand six hundred miles in diameter, and was audible even at points which are separated from Krakatau by one-sixth the circumference of the earth. This is about as if the explosions at Vesuvius should be heard in Boston. The great atmospheric waves caused by the successive explosions rolled at least three times around the earth, marking their passage by sensible movements of the barometer. The vapor ejected, mingled perhaps with the fine dust, from the volcano, was swept by the winds of the upper air to all parts of the earth, and for more than two years caused at sunset and sunrise the red skies which were so much remarked. The great wave of the sea produced during the explosion, which rose to a height of more than one hundred feet near the volcano, was felt along the shores of the Atlantic and Pacific Oceans. As to the amount of solid matter ejected during this eruption, the author, after a most laborious study of the problem, comes to the conclusion that it did not exceed about twenty cubic kilometres; while, according to the calculations of Junghun, the explosion of Tomboro, in the island of Sumbawa, in 1815, threw out 318 cubic kilometres. Our author, on recalculation, reduces this estimate to 150 cubic kilometres; still, it remains clear that the Tomboro explosion produced about ten times as much ashes as that of Krakatau, though it was far less violent.

We can but touch upon the conclusions of this masterpiece of scientific labor. It is not too much to say that it contains more, and more important, facts concerning the phenomena of volcanic explosions than have hitherto found place in the literature of the subject. The maps are well adapted to their purpose; the colored pic-

tures, though not in the highest state of the art, are satisfactory. We venture to commend these purely scientific volumes to the members of Congress and others who think that the United States is doing exceptional work in publishing treatises of no economic value. It is doubtful if our Government ever put forth a more costly monograph than this, or one less likely to help in bread-winning; yet this great gift to science comes to us from the Government of a far-away dependency of the thriftiest nation in Europe.

BOOKS OF THE WEEK.

- A First Reader. Boston: Ginn & Co. 30 cents.
 Bercy, P. La Langue Française. Méthode Pratique pour l'Étude de cette Langue. W. R. Jenkins. \$1.25.
 Bonier, H. de. La Fille de Roland. W. R. Jenkins. 25 cents.
 Bowen, C. W. Woodstock: An Historical Sketch. G. P. Putnam's Sons.
 Branch, O. E. The National Advanced Speaker. Baker & Taylor. \$1.25.
 Brooks, H. M. Some Strange and Curious Punishments. (Olden Time Series. Vol. v.) Boston: Ticknor & Co. 50 cents.
 Champeaux, A. de. Dictionnaire des Fondateurs, Censeurs, Modérateurs en bronze, et Doreurs. A—C. Paris: J. Rouam; New York: Macmillan.
 Checkmated, and Other Stories. Cassell & Co. 15 cents.
 Cleveland, R. J. Voyages of a Merchant Navigator of the Days that are Past. Edited by H. W. S. Cleveland. Harper & Bros.
 Collins, Mabel. The Prettiest Woman in Warsaw. Geo. Munro. 20 cents.
 Courmault, C. Jean Lamour, Serrurier. Paris: J. Rouam; New York: Macmillan.
 Dal Vero, M. Francis: A Socialistic Romance. Harper & Bros. 25 cents.
 D'Ennery, A. Love's Martyr; or, The Wife's Sacrifice. Rand, McNally & Co. 25 cents.
 Dick, W. B. Dick's Commercial Letter Writer. Dick & Fitzgerald. 50 cents.
 Dreyspring, A. Easy Lessons in French. D. Appleton & Co. 70 cents.
 Duplessis, G., and Bouchot, H. Dictionnaire des Marques et Monogrammes de Gravures. Part 2. G—O. Paris: J. Rouam; New York: Macmillan.
 Dyer, H. Records of an Active Life. Thomas Whittaker.
 Gogol, N. V. St. John's Eve, and Other Stories. Englished by Isabel F. Hapgood. T. Y. Crowell & Co. \$1.25.
 Grimm, H. The Destruction of Rome. Boston: Cupples, Upham & Co.
 Gruyer, G. Fra Bartolommeo della Porta et Mariotto Albertinelli. Paris: J. Rouam; New York: Macmillan.
 Hannay, D. Admiral Blake. (English Worthies Series.) D. Appleton & Co. 75 cents.
 Haskins, Rev. D. G. Ralph Waldo Emerson: His Maternal Ancestors. Boston: Cupples, Upham & Co. 25 cents.
 Hay, Mary C. A Wicked Girl. George Munro. 20 cents.
 Jewett, Sarah O. A White Heron, and Other Stories. Houghton, Mifflin & Co. \$1.25.
 Keep, R. P. Greek Lessons Prepared to Accompany the Grammar of Hadley and Allen. D. Appleton & Co. \$1.40.
 Ker, D. Into Unknown Seas. Harper & Bros. \$1.
 Kingsley, C. True Words for Brave Men. Thomas Whittaker. 75 cents.
 Lee, Vernon. Ottilie: An Eighteenth Century Idyl. The Prince of 100 Soups. Harper & Bros. 20 cents.
 Lee, Vernon. A Phantom Lover: A Fantastic Story. Boston: Roberts Bros. 50 cents.
 Lossing, B. J. Mary and Martha, the Mother and the Wife of George Washington. Harper & Bros.
 Luska, Sidney. As It Was Written. New ed. Cassell & Co. 25 cents.
 Marx, R. Henri Regnault. Paris: J. Rouam; New York: Macmillan.
 Matthews, B. The Secret of the Sea, etc. Chas. Scribner's Sons. \$1.00.
 Molinier, E. Les Plaquettes. [Les Bronzes de la Renaissance.] Vol. 1. Paris: J. Rouam; New York: Macmillan.
 Moscheles, Charlotte. Tales of Early German History. Franco-American Book Co.
 Patton, J. E. Dear Life: A Novel. D. Appleton & Co. 25 cents.
 Paris, Comte de. The Battle of Gettysburg. From the History of the Civil War in America. Philadelphia: Porter & Coates.
 Payne, W. H. Contributions to the Science of Education. Harper & Bros.
 Poore, B. P. Perley's Reminiscences of Sixty Years in the National Metropolis. Vol. 1. Philadelphia: Hubbard Bros.
 Porter, Admiral D. D. Naval History of the Civil War. The Sherman Publishing Company.
 Rouaix, P. Les Styles: 700 gravures classées par époques. Paris: J. Rouam; New York: Macmillan.
 Roux, J. Meditations of a Parish Priest. Englished by Isabel F. Hapgood. T. Y. Crowell & Co. \$1.25.
 Selections from Schiller's Lyrical Poems. Edited by E. J. Fother and E. D. A. Morshead. Macmillan & Co. 65 cents.
 Shooting. 2 vols. Moor and Marsh, Field and Covert. By Lord Walsingham and Sir Ralph Payne-Gallwey. [The Badminton Library.] Boston: Little, Brown & Co.; New York: Duprat & Co., 5 East Seventeenth Street.
 Sinclair, T. Humanitätsstudien. Strassburg: K. J. Trübner.
 Stockton, F. R. The Christmas Wreck, and Other Stories. The Lady, or the Tiger? and Other Stories. Chas. Scribner's Sons. 2 vols. \$2.50.
 Stubbs, W. Seventeen Lectures on the Study of Mediaeval and Modern History, and Kindred Subjects. Macmillan & Co. \$2.60.
 Tabor, M. The Three Systems of Life Insurance. Chicago: C. J. Johnson.
 The Forum. Vol. I. The Forum Publishing Company.
 The Sanitary Engineer. Vol. xlii. December, 1885, to May, 1886.
 Tighe, A. The Development of the Roman Constitution. D. Appleton & Co. 45 cents.
 Trouessart, E. L. Microbes, Ferments, and Moulds. D. Appleton & Co.
 Truina, H. Les Grands Écrivains Français. W. R. Jenkins.
 Tyler, H. W. Entertainments in Chemistry. Chicago and Boston: Interstate Publishing Company. 60 cents.