

mostly well disposed of. But some of the germs may find the proper soil, multiply, and cause disease. Of such diseases, consumption is by far the most deadly, and the one most easily spread, since the germs are being constantly scattered in the sputum in streets, public buildings, and public conveyances. Consumption is, however, preventible, and to this end the destruction of the sputum would distinctly tend. The author's severe strictures of the street-cleaning department are fully justified. "We virtually condone manslaughter just as long as we permit men to hold municipal offices who fail in their plain duty in the protection of the public health."

Germ-laden dust readily finds its way into private rooms: hence, after sweeping, the furniture and floor should be cleaned, not dusted. "Dust and its Dangers" is an excellent, suggestive, and temperate little book.

AMONG THE PUBLISHERS.

AMONG the features of *Outing* for January, 1891, are "Artificial Skating Ponds," by C. Bowyer Vaux, who teaches our boys how nature can be "coached" into the skater's service; and "Sailing on Skates," and the method of rigging up such an outfit.

—The D. Van Nostrand Company of this city have published, in a neat octavo of a hundred pages, a work on "Maximum Stresses under Concentrated Loads, treated Graphically," by Henry T. Eddy, C.E., Ph.D., professor of mathematics and civil engineering in the University of Cincinnati. It is a reprint from the "Transactions of the American Society of Civil Engineers," and is illustrated by twenty-five figures in the text and one folding plate. The object of the work, as stated by the author, is to introduce a new graphical method for determining what position a moving train of wheel weights must have in order to produce the greatest stress in any given part of the bridge truss or girder over which the train is passing. The method proposed depends princi-

pally upon the construction and use of a class of polygons or curves named by the author "re-action polygons." These are readily constructed graphically, and their properties are such as to give with ease the train positions for maximum stresses as well as to decide which one of several maxima is the greatest. The proof of these constructions is given in algebraic form, the graphical constructions being really only representations of the algebraic conditions for maximum stresses. The treatise shows how the algebraic theory leads to convenient graphical solutions of the equations of condition for maximum stresses, and will prove a serviceable addition to the growing literature of bridge engineering.

—In *The Chautauquan* for January, 1891, may be found "The Intellectual Development of the English People," by Edward A. Freeman; "The English Constitution," IV., by Woodrow Wilson; "England after the Norman Conquest," Part I., by Sarah Orne Jewett; "The English Towns," by Augustus I. Jessopp, D.D.; "Studies in Astronomy," IV., by Garrett P. Serviss; "How the People are Counted," by H. C. Adams; and "Plants in Legends," by Dr. Ferd.

—The American Book Company have just published "Greek for Beginners," by Edward G. Coy, professor of Greek in Phillips Academy. It is intended to be a companion book to the Hadley-Allen "Greek Grammar," and to be used as an introduction to either Coy's "First Greek Reader" or the *Anabasis of Xenophon*. A book bearing the same title, prepared by Professor Joseph B. Mayor, was published in London in 1869. An American edition of that book, considerably altered in form, was published in 1880 as "Coy's Mayor's Greek Lessons." The book now issued is a revision of the last-named edition, but the changes introduced by Professor Coy are so numerous and extensive, that, in justice to both Professor Mayor and himself, he has deemed it advisable to assume the entire responsibility for the work. He has therefore

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dropped Professor Mayor's name from the titlepage, although acknowledging his indebtedness to that gentleman's book. The distinctive features of the work as now presented consist in its "building-up a boy's knowledge of Greek upon the foundation of his knowledge of English and Latin," and in the fact that "no Greek words have been used in the earlier part of the book except such as have connections either in English or Latin."

—Among the recent publications received from the United States Coast and Geodetic Survey Office is "Appendix No. 8, Report for 1888 (90 pp. sketch), entitled Geodesy. Geographical Positions in the State of Connecticut. Prepared for publication by Charles A. Schott, assistant." This collection of geographical positions, and of geodetic data resulting, is made in continuation of the scheme of publishing the results in those States where the field-work of the triangulation is substantially completed, and where the triangulation could be made to rest on the standard data of the survey.

—An interesting paper by Professor von Hofmann, upon the dissociation of carbon dioxide gas into carbon monoxide and oxygen by means of the electric spark, is referred to in *Nature* of Dec. 4. Dalton and Henry long ago showed that carbon dioxide, although formed by exploding a mixture of two volumes of carbon monoxide with one volume of oxygen by the passage of an electric spark, is again partially decomposed into carbon monoxide and oxygen by the continued passage of the spark. This dissociation, however, is very slow, and usually incomplete. Hofmann and Buff, in the course of their well-known work upon gaseous re-actions, further showed that "the electric spark passes through carbon dioxide with a violet glow, producing at first a rapid increase in the volume, which, however, becomes less and less marked until at the expiration of about half an hour the separated carbon monoxide and oxygen recombine with a sudden explosion, the re-formed carbon dioxide at once commencing to be

again dissociated." Deville and Berthelot afterwards investigated the same phenomena, and also found that the re-action was never complete, proceeding only until about 28 or 29 per cent of the carbon dioxide was decomposed, but they never observed any explosive recombination as described by Hofmann and Buff. Professor Hofmann has therefore determined the exact conditions under which the explosive recombination occurs. It certainly appears somewhat remarkable that the same spark can effect both dissociation and recombination; yet such, within the limits described in the memoir, is an actual fact. The first essential point to be observed is the length of path of the spark. The most suitable distance apart of the platinum terminals appears to be between two and a half and three millimetres, and Professor Hofmann advises the use of adjustable terminals rather than the ordinary platinum wires fused into the side of the eudiometer. A Leyden jar in the circuit renders the occurrence of periodical explosions more certain. The spark should also pass at about a quarter the height of the gas column, instead of, as usual, near the top. The current itself, moreover, should not be too strong: that from two Bunsen cells and only a moderate sized Ruhmkorff coil is quite sufficient, and yields the best results. It is also preferable to use a volume of carbon dioxide, previously dried over oil of vitriol, not exceeding ten cubic centimetres at a pressure of 650–700 millimetres: eight cubic centimetres give excellent results. Under these conditions, the first explosion usually occurs in from fifteen to twenty minutes, and sometimes earlier. The flame commences in the neighborhood of the spark, and then perceptibly spreads through the whole length of the gas column. It is colored blue in the first explosion, and green in the succeeding ones, owing to the volatilization of a little mercury vapor. The second and succeeding explosions occur after shorter intervals than the first. This experiment is certainly one of the most interesting in all the range of dissociation phenomena; and full details, with drawings of the apparatus, are given by Professor Hofmann in his memoir.

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