

with motion, gravitation, inertia and energy, all units measurements and numerical examples being expressed in the metric system. Following these are sections treating of the elementary phenomena of heat, light and electricity. Magnetism, however, strangely enough, appears to have been entirely neglected, but no statement is made in explanation of this somewhat unusual omission. The arrangement and style of both text and illustrations are very good, the only objectionable feature being the ambiguity of a few of the mathematical signs, this being probably explained by the statement of the author that French types were used in this book. Some 240 illustrations add considerably to the utility of the volume.

Part iii, "Practical Chemistry," presents, in the form of a number of described experiments, the mode of preparation and properties of the more common elements and simple compounds. In addition to the actual descriptions of these bodies, much correlative matter is also included as to their distribution and economic use. A noticeable omission, from the reader's point of view, is the fact that no equations representing the preparations and reactions of the various substances are given in the text. A collection of equations is, however, given in an appendix at the end of the volume, but it is specially mentioned that the matter contained in this appendix is beyond the scope of the examination. Seeing that this is the third year of the pupil's training, and considering the important manner in which chemical equations enable a student to more easily understand the nature of a reaction by showing at a glance how the several constituents of a mixture arrange themselves, it is difficult to agree with such an omission. The experiments themselves are well chosen, and are usefully illustrated by numerous cuts of the apparatus in position. Each substance is discussed under the headings:—(1) Preparation; (2) Physical properties; (3) Chemical properties; (4) Occurrence and Uses.

*L'Échappement dans les Machines à vapeur.* By G. Leloutre. Pp. 156. (Paris: Gauthier-Villars. Masson and Co., 1900)

*Produits aromatiques; artificiels et naturels.* By Dr. G. F. Jaubert. Pp. 169. (Same publishers.)

THESE two volumes are the latest additions to the comprehensive series published as the *Encyclopédie scientifique des Aide-Mémoire*. M. Leloutre has for many years carried on experimental and analytical researches upon steam engines, with particular reference to the condition of the steam in a cylinder during compression and exhaustion, and under different conditions. In the present volume he extends the results arrived at in his "Théorie générale de la machine à vapeur," and adds to his fundamental equations for the analysis of the trial of a steam engine a sixth term depending upon the condition of the steam in the cylinder at the end of the exhaust.

The natural and artificial aromatic substances at present known are tabulated by Dr. Jaubert. They are arranged in five classes, namely, aromatic alcohols; aromatic acids; terpenes; camphors; alcohols, aldehydes and terpene acids. A short description is given of the characteristics of each class, and following it are tables showing the commercial name, scientific name, empirical and constitutional formulæ, method of preparation, references to literature, properties and characteristic reactions. The study of these compounds is now the most important branch of organic chemistry, not only from the point of view of pure science, but also on account of their commercial value. The book should therefore be found of service to both chemists and pharmacists, as a convenient work of reference.

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*Grundzuge der geographisch-morphologischen Methode der Pflanzensystematik.* By Dr. R. von Wettstein. Pp. 64. Mit 7 lith. Karten und 4 Abbildungen im text. (Jena: Gustav Fischer, 1898.)

THIS suggestive little work, coming as it does from the pen of Prof. von Wettstein, will be read with attention by all who are interested in the wider problems of systematic botany. The author contends that a separation of species or sub-species on morphological grounds alone is unsatisfactory, and he reminds his readers that the appreciation of differences by this method must be ultimately a purely subjective one, and that the conclusions arrived at are liable to be vitiated on several grounds. Von Wettstein pleads for a more general recognition of the geographical areas occupied by species, and considers that a careful study of these will eliminate errors due to modifications depending on climatical or other physical conditions; and it is well known how efficient these are in producing races which, though retaining a general resemblance to a common ancestor, may yet be greatly dissimilar amongst themselves.

He applies his methods to a study of the *Endotrachea* series of *Gentians*, and thus comes to reduce the twenty-two species to six ground-forms or genuine species.

He further discusses some of the *Euphrasias*, and arrives at a corresponding result. It may, however, be urged that this method also is open to objection, and that more is to be got out of the study of species by experimental cultivation—an arduous task, but one which will perhaps yield more fruitful results than even the application of the geographical-morphological method.

*Dreams of a Spirit-Seer, illustrated by Dreams of Metaphysics.* By Immanuel Kant. Translated by E. F. Goerwitz, and edited with an introduction and notes by Frank Sewall. Pp. xiv + 162. (London: Swan, Sonnenschein and Co., Ltd., 1900.)

THE chief object in publishing this translation of Kant's "Traume," which first appeared in 1766, is to show the relation between the philosophy of Kant and the teachings of Swedenborg. Students of metaphysics and psychology will appreciate this aid to a study of Kant's philosophical development.

#### LETTERS TO THE EDITOR.

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##### On the Process of Dyeing with Woad Alone.

IN my paper in NATURE (February 1, 1900, p. 331) on the blue colour in woad, no account is given of the method by which prepared woad can be used for dyeing wool blue. Some of my friends have suggested that the above-named communication was, in consequence, like the play of *Hamlet* with the Prince of Denmark left out. The request for information then made as to the *modus operandi* of the mediæval dyers who used woad and woad alone for dyeing blue has up to the present yielded no response.

There exists a tendency to believe that by long-continued cultivation the woad now grown and prepared in this country has lost its power of dyeing blue, and is only of use in setting up fermentation in the indigo vat. It is, however, very improbable that a plant like *Isatis tinctoria* should entirely lose so characteristic a property as that of indigo-formation. It was, however, possible that some variation in the details of its manufacture might have had this effect. That fresh woad still can be made to yield indigo was shown, and the process of extracting it given in detail, in the paper above referred to.

Prepared woad is a dark brown, earthy-looking paste having an ammoniacal odour, yielding a yellowish-brown solution to water, and looking as unlikely a source of a blue dye as could