

by converting it into yeast without any decomposition of sugar, otherwise than into alcohol and carbonic acid.

The brewing of beer on this system has latterly extended beyond Bavaria, and it is now extensively practised in Austria and the Rhine district, where the frequent occurrence of basalt and other porous volcanic rocks presents great facilities for making brewing vaults and cellars, in which a low temperature can be maintained. The various details of the art of brewing have also been carefully studied by chemists with Government support, and the rapid progress of this industry in Germany serves well to illustrate the great advantages resulting from the application of scientific skill to practical subjects. There are not a few of our own industrial arts that would be, in like manner, benefited by a better appreciation of the aid which science is capable of rendering them; not a few that are sorely in need of this aid to enable them to keep abreast of the progress made in other countries.

BENJAMIN H. PAUL

#### OUR BOOK SHELF

*Handbuch der Allgemeinen Himmelsbeschreibung.* Von Hermann J. Klein. Das Sonnensystem. (Braunschweig, 1869.)

THIS work professes to combine a full account of the most recent physical discoveries in astronomy, with an exact statement of all those points which are commonly met with in handbooks of the science. The present volume, as will be gathered from the title, deals only with the solar system. Certainly it cannot be said to bear out in full the promise of the author. We are particularly struck by the almost entire absence of reference to the labours of English spectroscopists within the bounds of the solar system. Mr. Huggins's researches on cometic spectra are briefly referred to; but his observations on the spectra of the planets are passed over in silence, while place is given to the comparatively less valuable researches of the Padre Secchi on the same subject. We should be far from desiring to undervalue the researches of the eminent Italian astronomer; but no one who is acquainted with the circumstances under which Mr. Huggins and Father Secchi have respectively observed the planetary spectra, could think (we imagine) of comparing the Italian with the English series of observations. A similar remark applies to the solar researches of Father Secchi, which have not been made with sufficient dispersive power to be fairly comparable with the researches of Mr. Lockyer. Yet the labours of the last-named observer are passed over unnoticed, not only in the body of the work, but in an appendix, wherein the author treats specially of recent solar observations. In a note, a brief and inexact account is given of Mr. Lockyer's discovery that the bright lines of the prominence spectra can be seen when the sun is not eclipsed. After this, it is surprising to find that a full account is given of Professor Tyndall's ingenious theory of comets.

The treatise is one, however, we can on the whole recommend. The arrangement of the chapters on the planets is particularly clear and satisfactory. It is noteworthy that the author, with praiseworthy exactness, gives the secular variations of the planetary elements to the term involving the square of the time.

We were inclined to take exception at the manner in which Professor Adams's labours on the planet Neptune are left to the very end of the chapter on the planet; and we still think that their proper place would have been immediately after the account of Galle's detection of Neptune. This, however, is perhaps a small matter; and the statement of the relative claims of Adams and Lever-

rier is in pleasing contrast with the unjust account which some continental astronomers have not scrupled to give of the matter. Not only does Herr Klein recognise the claims of Adams, but he assigns the just and sufficient reason for putting the two astronomers on the same level, that "Leverrier can no more deserve credit because Neptune was actually discovered before the end of September 1846, than Adams can deserve blame because Challis, up to that very time, though he had indeed found Neptune, had not yet recognised the planet."

R. A. PROCTOR

*St. Pierre's Dictionary of Botany.*—*Nouveau Dictionnaire de Botanique.* Par E. Germain de Saint Pierre, avec 1,640 figures. Pp. 1,388. (Paris: J. B. Baillière et fils, 1870. London: Williams and Norgate.)

WHEN it is recollected that this bulky volume is the product of a single mind, the industry, no less than the encyclopædic knowledge of its author, strikes the reader with astonishment. Whether it is desirable in the interests of science that a publication of this kind should be the work of one man is another question. The system pursued in the compilation of cyclopædias, of relegating each separate article of importance to the man who has paid special attention to that particular subject, has its advantages, and what is lost in unity is gained in exactness and thoroughness. In these days of subdivision of scientific labour, even a man of M. Germain de St. Pierre's vast erudition cannot be the highest authority in every branch of his science, and accordingly we find the articles of very unequal interest and value. Thus, under the head "Herborisation" occurs a list of plants gathered in the environs of Paris by Cornuti, in 1635, valuable, no doubt, in its way, but altogether out of place in a botanical dictionary. On the other hand, so many interesting observations have lately been made on the physiology of climbing plants by Mr. Darwin and others, that we turned with interest to this volume to acquaint ourselves with the newest researches on the subject. The heading "Liane" does not appear at all, while under "Grimpant" there are just a dozen lines, and no reference to any other article. Dissertations on the relative advantages of living in Paris and in the country like that under "Laboratoire du Botanique" might have been altogether spared. Other objections might readily be made to the plan of the work. A short description of the leading characters of each natural order is useful, but the utility would have been increased by inserting the Latin names of the orders, with a reference from them to the French names, as from *Ranunculaceæ* to "*Renonculacées*," or from *Umbelliferae* to "*Ombellifères*." The selection of a few genera and even species for description does not commend itself in the same manner, and the selection must necessarily be arbitrary and partial. Nevertheless, with these defects, we have in the work before us a most useful and valuable cyclopædia, containing an immense mass of information on every branch of botany, which cannot fail to be almost a necessary book of reference alike to the man of science and the student. On those subjects in particular in which M. St. Pierre is an acknowledged authority second to none, the work is especially valuable. The illustrations are copious and admirable.

A. W. B.

THE second fasciculus of the twelfth volume of the *Atti della Società Italiana delle Scienze Naturali*, which has lately reached us, contains only two zoological papers. The most important of these is a systematic catalogue of the testaceous mollusca of the neighbourhood of Spezia and of its gulf, by Dr. C. T. Canefri, which will be of value to the student of geographical distribution. The other includes the first century of South American Coleoptera, by Prof. P. Strobel, with descriptions of numerous new species by Dr. E. Steinheil.