

following up the hints given by Sir Henry Holland, Prof. Wendell Holmes, and some others, useful results might be obtained. It is difficult to help agreeing with Sir Henry when he remarks that the opinions of Comte on this subject are a sheer paradox (p. 97). Comte strangely denied the competence of consciousness as an interpreter of mental functions. It may perhaps be allowed that consciousness has not been happily investigated hitherto, but it would be wholly premature to assert that it is incapable of scientific investigation.

W. STANLEY JEVONS

#### URE'S "DICTIONARY OF ARTS"

*Ure's Dictionary of Arts, Manufactures, and Mines.* By Robert Hunt, F.R.S., Keeper of Mining Records, &c., &c., assisted by F. W. Rudler, F.G.S., and by numerous contributors eminent in science and familiar with manufactures. Seventh edition, in three volumes. (London: Longmans, 1875.)

THIS well-known work, of which the seventh edition is now before us, first made its appearance in the past generation. During the life-time of its original projector and editor, Dr. Andrew Ure, it undoubtedly contributed largely to advance the education and progress of our manufacturing and industrial classes, and well-thumbed copies of it are to be found on the library shelves of all the "Mechanics' Institutions" which the educational revival of thirty years ago scattered over the land.

We find from the preface that since 1858, when the present editor took charge of the work, three editions, including the present, have appeared, so that its reputation as a standard work of reference appears to be still maintained.

In the volumes now before us, there are, as might be expected, great differences from the edition which preceded them, many new industries having arisen, while others, if they have not altogether disappeared, have at least lost much of their importance. The alterations thus arising have overpassed the space left available by the curtailment and omission of some of the articles which had lost their value, and have increased the size of the work to a total of 3,255 pages for the three volumes. Although a long list of contributors succeeds the preface, we imagine that the burden of the major part of this increase must have fallen on the two editors, and it is therefore with considerable pleasure that we congratulate them on the thorough manner in which the revision has been effected, and the very full and complete information given in nearly all cases. We must not, perhaps, complain if the information given in such articles as "Alizarine" and "Aniline" is not very full, since the complete knowledge of the actual methods of production employed in these and in other cases of chemical manufacture are in the possession of persons whose interest it is not to be very explicit in matters involving manufacturing secrets. While, however, the editors are to be praised for keeping the articles abreast of the time in other respects, we cannot agree with them that it is good policy to retain, as they have done, the old equivalentic formulæ beside the atomic ones which are now, and have been for years past, in such general use as to justify the exclusion of the former altogether, as has been done in every other work

on chemical subjects printed within the last five years. The acquisition of the modern views and system of formulæ is really so simple a matter that there is no justification for its not being made by everyone interested in the science, and the retention of both forms tends to confuse young workers while conferring at best a doubtful benefit upon those who, having learnt the older form, are not made to feel the necessity of learning the newer.

As may be supposed from the names of the editors, the parts relating to mining and metallurgy are extremely full of valuable information, and we notice particularly an article on coal-cutting machines, one on safety apparatus for mines, and one on mine-ventilation, as deserving attention. Much information is given on printing, and the mixed chemical and mechanical art of calico printing is most exhaustively treated. In the article on the soda manufacture, a good sketch of Schloësing and Rolland's process is given. The explanation of the devitrification of glass, given in vol. ii. p. 647, is, however, only probably true in a limited number of cases, in many the change being molecular only, and not involving the formation of definite silicates.

The article on coal-gas is particularly full and well written; but in fact this may be said of so many of the subjects treated that it becomes an invidious task to attempt to point out the shortcomings which are in some cases unavoidable in a work of this magnitude, while it is a pleasant one to congratulate Messrs. Hunt and Rudler on the care and ability bestowed on a task of great difficulty. We have only to add that the type of the work has been entirely reset, and the titles of the articles printed in a bold type which renders reference easy.

R. J. F.

#### DRUMMOND'S "LARGE GAME OF SOUTH AFRICA"

*The Large Game and Natural History of South and South-east Africa.* From the Journals of the Hon. W. H. Drummond. (Edinburgh: Edmonston and Douglas, 1875.)

THE countries of Amazulu, Amatonga, and Amaswazi form the tract of land bounded on the south by Natal, and on the west by the Transvaal Republic. These were the scenes of Mr. Drummond's experiences, which, he tells us, extended over a period of some five years, ending in 1872. He candidly admits that his knowledge of Natural History as a science is little or nothing, in consequence of which all reference to questions bearing on the subject are omitted, except those which have come within his personal knowledge. Such being the case, we think that we cannot do better than make an attempt to summarise the direct information which the author places before us on those biological questions which are in any way referred to, leaving the discussion of the many valuable observations on sport in general to contemporaries who are in the habit of keeping those subjects in constant view.

Of the nine chapters which constitute the work, the first six treat of the buffalo, rhinoceros, eland, elephant, lion, and leopard; the remaining three being devoted to anecdotes connected with dogs, antelopes, and game birds.