The work although published in London has been printed at the Glasgow University Press, and in the clearness of the type and rendering of the cuts, reflects great credit on the printer. Altogether the volume is a very handsome one. We wish it a similar measure of success to that which has attended the first edition.

The Physiology of the Domestic Animals: A Text-Book for Veterinary and Medical Students and Practitioners. By ROBERT MEADE SMITH, A.M., M.D., Professor of Comparative Physiology in the University of Pennsylvania, &c., &c. With over 400 Illustrations. Philadelphia and London: F. A. Davis. 1889. 938 pp.

SUCH a text-book as this has long been a desideratum with veterinary students and practitioners. As the author remarks, "while French students have access to the encyclopædic work of Colin, and those familiar with the German language to the admirable works of Schmidt-Mülheim, Brückmüller, Munk, Ellenberger, Gurlt, Thanhofer, Müller, and others, English-speaking students have absolutely no work to which they can turn to obtain any application of the laws of physiology to the functions of the domestic animals." Within recent years a vast amount of research has been carried on, more especially in Germany, in the domain of animal physiology, with painstaking detail, and infinite patience and accuracy of observation. Thus, for example, the investigations of Pettenkofer and Voit into the laws of nutrition have almost entirely revolutionised the older methods of considering this subject, giving, as they do, facts and figures where formerly there was little more than conjecture and theory. These and other similar researches have been conducted on all the more common kinds of animals, and Professor Smith, who has kept himself abreast of all the most recent developments of the science, has taken a broad view of his task, and has not confined himself to the domestic animals alone. He has incorporated much that pertains more especially to human physiology, while at the same time, in the discussion of the various functions, he has drawn his illustrations from the whole realm of animate nature, and has introduced short and interesting sketches of the mode of development of the mechanisms by which these functions, in passing from lower to higher forms, are accomplished. It is this comparative method that gives his book its special charm, and while the

needs of the veterinary students are nowhere overlooked, the text-book will come as a real aid to medical practitioners who wish to take a broad and philosophical view of the vital functions as manifested in man.

The book is divided into two parts, dealing respectively with General and Special Physiology, and the Reproductive Functions.

In the first part, we have a consideration of the structure of organic bodies, of the general properties of cells, their origin, their forms, and the mode of development of tissues and organs. A full and clear statement is given of the physical laws which regulate cell growth, and a long section is devoted to cellular chemistry, and the nature and reactions of the various proximate constituents of the body. Considerable attention is paid to the products of the growth of vegetable cells, and an interesting comparison is made between the vital processes in plants and animals.

The second part deals with the nutritive and animal functions. It begins with a section extending to over 30 pages on the subject of foods. Under this heading we find an elaborate description of the various kinds of fodder, the cereals, leguminous plants, and vegetables, such as potatoes, beets, and turnips, with practical directions as to the best methods of using these. The animal and inorganic foods are dealt with more briefly, but even here we get useful hints, as, for example, in regard to the value of a plentiful supply of common salt in the food.

The section on digestion, extending to about 250 pages, is naturally one of the main features of the work. After describing, with numerous illustrations, the characteristics of the digestive apparatus in animals of every grade of development, the author treats of the changes undergone by food in digestion. The various methods of prehension of food, the modes of dentition, mastication, and insalivation, are fully figured and explained. Then come chapters on deglutition, rumination, gastric and intestinal digestion, all copiously illustrated. The section showing the diversity of ways in which the function of digestion is accomplished is of special value to medical men as casting many side-lights upon the complex processes involved in the case of omnivorous man, and will give much useful information to those engaged in the rearing of the domestic animals.

The chapters on absorption, lymph, chyle, and the blood are full and suggestive, the active function of the villi in absorption being well explained. The circulation of the blood is next considered, and here we find advanced the theory of

Küss as to the action of the auriculo-ventricular valves, which will probably be new to most, and worthy of consideration. Instead of supposing that the occlusion of the auriculo-ventricular orifices is purely passive, and produced by the pressure of the blood behind the valves, causing their ascent, Küss maintains as follows:—"If the finger be introduced into the auriculo-ventricular region at the moment of the systole of the ventricle, we find that the kind of funnel which hangs from the auricle to the ventricle is continued; it even appears to lengthen itself out, and the finger, as it were, is drawn into the interior of the ventricle. In fact, the first result of the contraction of the papillary muscle is the lengthening of the auricular cone, the edges of which are afterward brought near each other. While this hollow cone descends into the ventricle, the sides of the latter contract and approach the cone in such a manner that the auriculo-ventricular apparatus acts as a sort of hollow piston which penetrates the ventricle and comes into close contact with its walls, and thus the ventricle empties itself completely, the contact becoming perfect between its sides and the auricular prolongation." He holds that this prevents reflux of blood, assists in the suction of blood from the veins into the auricles, and accounts for the presence of the papillary muscles, and the form of the auriculo-ventricular valves, as distinguished from the semilunar valves.

The chapter on respiration is well written, although we miss any reference to Marckwald's investigations; and the remarks on mammary secretion and the description of various kinds of milk will repay careful perusal.

Renal secretion is clearly described, although too little importance is attached to the velocity as opposed to the pressure of the blood in determining the rate of excretion.

Next follows a chapter on nutrition, which is well up to date in its account of tissue metabolism, the fate of the various kinds of food stuffs in the body, the normal amounts required by the domestic animals, and giving many practical hints as to feeding them, but showing also how much may still be done in this intricate and difficult subject.

Under the term "the animal functions" are described the physiology of movement and the physiology of the nervous system. Having described the histological appearances and chemical composition of muscle, the author discusses very elaborately the processes involved in locomotion, this part of the subject being well illustrated, both with diagrams from standard works and also by drawings from the series of

instantaneous photographs taken by Muybridge, of the University of Pennsylvania.

The chapter on the nervous system also shows intimate acquaintance with the most recent work on the subject.

The chapters on the senses and the reproductive functions, while giving a fair survey of these subjects, might have been considerably enlarged.

The style in which the book is written is clear and lucid. A few slips may be noted here and there, but they are few and far between, and will no doubt be put right in a second edition. The diagrams are mostly taken from the best sources, but are sometimes printed so black as to obscure the finer details.

On the whole, Professor Smith's work may be confidently recommended to all medical men, and to those interested in the rearing of horses, cattle, or other domestic animals, as far and away the best book on the subject that has yet appeared in the English language, and it is certain to have an extensive circulation when its merits become more widely known.

Intracranial Tumours. By BYROM BRAMWELL, M.D., F.R.C.P.E., F.R.S.E., Lecturer on the Principles and Practice of Medicine in the Extra-Academical School of Medicine, Edinburgh; Assistant Physician to the Edinburgh Royal Infirmary. Edinburgh: Young J. Pentland. 1888.

THIS volume is based on a series of lectures, but the lecture form has been departed from, and, in reality, it is rather a systematic treatise on the subject. The endeavour has evidently been made to make it very complete, the whole subject of cerebral tumours being exhaustively considered, not only on the basis of Dr. Bramwell's own personal experience, but also by analysis of the writings of the leading exponents of nervous pathology. The practitioner will thus find in this book a very complete compendium of the present state of knowledge in regard to the subject of which it treats. But we fear that he will agree with us in thinking that several sections have been treated in too discursive a manner, and that there are evidences of want of digestion of the opinions of those authorities who are so fully and so frequently quoted.

Starting with a definition which includes all intracranial tumours except abscesses, the author discusses the etiology of these, their general pathology, and their symptoms and clinical