of the essay, while it would be superfluous for us to add that from beginning to end it is pleasantly written, and delightful to read. Those well acquainted with the "Principia" will find much that will interest them, while those not so fully enlightened will learn much by reading through this account of the origin and history of Newton's greatest work.

WELLS ON ENGINEERING DESIGN.

Engineering Drawing and Design. By Sydney H. Wells, Wh.Sc., A.M.Inst.C.E. In Two Parts. (London: Chas. Griffin and Co., Ltd., 1893.)

THIS book is intended for the use of engineering students in schools and colleges, and as a text-book for examinations in which a knowledge of practical geometry and machine drawing is required. The author says in the preface that the chief reason which has led to its preparation is that during the time he was engaged in teaching on the engineering side of Dulwich College, he found it impossible to obtain a suitable text-book.

The work is published in two parts. Vol. i. deals with the geometrical part of the subject, but includes many references to practical questions and machinery wherein is to be found the applications of the particular geometrical construction. In the earlier treatment of this subject we find much excellent instruction for beginners, written in a clear and concise manner. The methods of construction described are all clearly illustrated, and appear to have been chosen from the best examples.

Vol. ii. deals with "machine and engine drawing and design." In the preface we find the following statement: "A student ought not to be told the sizes of bolts and nuts, or the diameter of flanges, or the details of stuffing-boxes, in drawing an engine cylinder, any more than we should expect to have to prove to him the truth of the triangle of forces, at each step in the graphical determination of the stresses in a roof truss." This statement evidently comes from the technical school view of mechanical engineering. The triangle of forces is certainly a safe assumption; but to allow one of Mr. Wells' students fresh from college to run wild in a drawing-office of an engineering works where standards are the rule, and not the exception, would be a treat not to be missed. No doubt he could turn out an excellent "technical school" drawing, but whether it would "pay" is another matter. A draughtsman generally has standards for flanges, glands, studs, &c. for an engine cylinder. Notwithstanding this, we congratulate the author on the contents of vol. ii. of his book; he has gone as far as he can to lead his students into the way of being draughtsmen; and of course this, after all, can only be accomplished—or, rather, completed—in the drawing-office of a mechanical engineer.

For the many examples and questions included in the second part we have nothing but praise; they are taken from every-day practice, and are amply elucidated. On page 183 we are told that copper pipes are made from malleable sheets, and may be as thin as $\frac{1}{16}''$. Very few copper pipes of small diameters are now used by engineers made in this way; they are usually solid drawn When iron or copper pipes require flanges, these are generally brazed to the pipes; screwed flanges with lock-nuts are seldom, if ever, used. Unions for small brass and copper pipes are usually brazed, and not screwed on the pipes, as shown in Fig. 124*d*.

Section 26, on steam engine design, is well done. It is quite refreshing to find in a text-book of this kind that questions of manufacture and shop practice are considered worthy of notice; as a rule, such details are carefully omitted—to the student's loss. The piston-rings shown in Fig. 180*a* are far too narrow for general work; and again, in Fig. 187, illustrative of a crosshead for a single slipper guide, the slipper is far too light for its work, besides being defectively attached to the crosshead. Further on, in Fig. 191, showing a connecting-rod end, surely the author would not recommend the strap to be machined out square at the corners as shown; the much-abused "practical man" would put in a radius instead, and by so doing increase the strength considerably. The brasses are also shown apart; whereas they must be tightly brought together for the type of rod end illustrated.

Beyond these few points, the two volumes are exceedingly well written, and will be of great use to students in our technical colleges. The author has taken great pains to ensure the clearness of his descriptions, and has succeeded in producing a thoroughly useful work.

N. J. LOCKYER.

THE EGYPTIAN COLLECTIONS AT CAMBRIDGE.

Catalogue of the Egyptian Collection in the Fitzwilliam Museum. By E. A. Wallis-Budge, Litt.D. (Cambridge: University Press, 1893.)

WE recently noticed at some length Dr. Wallis-Budge's book entitled "The Mummy," and mentioned that it was intended as an introduction or a supplement to his catalogue of the antiquities which belong to the University. The catalogue itself is now before us, and is, as might be expected, a scholarly piece of work. There are people who like to read catalogues; to them this volume should prove to be of greater interest even than its companion "The Mummy"; but fortunately tastes differ, and we confess that, except perhaps to a scholar of endowments equal to those of Dr. Budge himself, "The Mummy" is the better of the two. It is satisfactory, however, to remember that the Fitzwilliam collection has been duly catalogued by competent hands, and that this catalogue is now published in an accessible form, Cambridge thus taking the lead among English universities in allowing the world to know what treasures it possesses of ancient Egyptian art. This knowledge is very valuable to the student. How many of us, for example, have seen and admired at the Louvre the granite sarcophagus of Rameses III.? Yet how few of us have known till now that the lid of the same coffin is at Cambridge? When Oxford has published a catalogue like this, and when the British Museum has followed suit, the cross references from one collection to another will in