Logarithmic and Other Mathematical Tables. By William J. Hussey, Professor of Astronomy in the Leland Stanford Junior University, etc. Ann Arbor: Register Publishing Co. 1892.

For the semi-occasional user of logarithms, collections like Köhler's are best. But a person who is destined to use up several books of tables by the wearing-down of the paper under his fingers--which commonly happens to expert mathematicians--will prefer to be provided with four-place, five-place, six-place, and seven-place tables, since the expenditure of time in working with these is in the ratios of 1:2:3:4, respectively. Can the tables before us be recommended as being about as good as others? They are printed upon paper fairly opaque and quite free from sheen, substantial but rather cottony to the touch and too white. A small page is a recognized advantage in tables of logarithms. These pages are taller than those of any five-place tables we know except Hoüel's. The ink is not quite so black as we could wish, and some pages are a little gray. Very many figures look as if printed from worn types. The fourth figure of log. 4092 comes from a wrong font. The alignment leaves much to be desired. The type is of the old pattern, which in our judgment is preferable to the Huttonian character (the pattern now common in ordinary printing, invented, it is guessed, by Dr. Charles Hutton in 1783), but inferior to the Egyptian, which are all of one height but without hair-lines.

We may examine the arrangement of the tables of logarithms of numbers. Each tenth value of the argument is printed in Huttonian type. This gives it sufficient prominence; the large black round-numbers of Babbage are unnecessary. The table is arranged in a Newtonian block, which we deem more convenient than the columnar form, especially since it brings twice as many numbers on each page. The table everywhere opens to exactly 1,000 logarithms, not counting those on the last line, which are a sort of catch, or rehearsal of the first line of the next page. This is a point of great superiority over Bowditch, Schlömlich, etc. The numbers in each tenth line are placed between horizontal rules, while the intervening nine lines are divided by leads into three sets of three. This is the plan of the highly approved tables of Bremiker; yet we prefer, with Schrön and others, the division by leads into sets of five. The first two figures of the five-figure logarithms are given only in the first column at the top of the page and where they change. Bremiker thus separates only one figure, while Bowditch gives all five in every column. The ten columns of the block are all separated by vertical rules, that after the fifth being extra heavy. This is the customary way, but we are fully persuaded that all these vertical lines are productive of error in following the horizontal lines with the eye. We consider the tables of Schlömlich, Oppolser, J. M. Peirce, and others, which omit all but the line after the fifth column, as much the more comfortable.

The indication of a change of the figure in the last place of unrepeated decimals is by an asterisk prefixed to every logarithm affected. This is decidedly the best method. The proportional parts are exact to the sixth place. The practice of thus printing the proportional parts arose in consequence of Babbage, in his seven-place table, printing a dot under every terminal figure which had been increased. This he did on the ground that all information which could be given without disadvantage should be given--a good principle for seven-place tables, without a doubt. Only, upon that principle, De Morgan's plan should be adopted of distinguishing the quarters of the last unit by means of the four ordinary punctuation marks, thus making the tables accurate to a fraction of the number entered equal to unity divided by a power of ten. However, Babbage's system was extensively adopted, and consequently it was necessary to give the proportional parts more accurately. Prof. Hussey prints a dash over every increased 5, whether it be terminal or not, and over no other increased numbers. It luckily happens that there is no case in the tables of an increased 5 followed by three zeros, otherwise the system would break down. Now, we think a system illogical, and therefore inelegant, which can only be carried out by virtue of an accident. But what is the use of carrying the proportional parts to six-places? Everybody must allow that it would be bad economy of time in computing to write down one's numbers alternately to five and to six places of decimals. Now, what difference does it make that we add the six-place numbers in our heads? A centimetre and a half at the bottom of each page of the table is devoted to giving the values of S and T, and that not unambiguously. This seems decidedly awkward.

There are trigonometrical tables, both logarithmic and natural, tables of addition and subtraction logarithm, etc. At the end of the book are given formulae and constants. The latter are pretty carelessly collected and copied. The velocity of light is made to be 296.944 kilometres per second! Clarke's value of the metre in inches, 39.370432, is given, although its error has been known for many years. First Prof. Rogers and then Gen. Comstock made fairly concordant determinations, very different from Clarke's. In fact, his was merely the result of measuring copies of Bessel's toise in inches, and then deducing the length of 443.296 lines of the toise, this being the number of lines of the toise de Pérou intended to make the metre at the time of the construction of the latter. But recently M. Benoit of the International Bureau has shown that the metre so deduced from Bessel's toise is too long by its 74,000th part. So, correcting Clarke's determination, and combining it, reduced to a weight of 1/5, with the values obtained by Rogers and Comstock, we find:

	Inches
Rogers	39.37027
Comstock	39.36985
Clarke, corr. by Benoit	39.36990
Weighted mean	39.37004

This makes 25.40003 millimetres in an inch. If we remember, then, that 39.37 and 25.4 should each be increased by one-millionth part of itself, we shall have the fact as accurately as it is known. We find this convenient rule used in the Yaryan Company's Tables. Prof. Hussey's book will do for easily contented computers.