

would amount to a substantial sum in the course of a year. When it is considered that 1d. per pair would, in the larger factories, amount to more than the salary paid to the factory-manager, the importance of small amounts is emphasized.

Having calculated the factory standard costing for each sample to be made, the costs are later used to judge whether the work done by each department has resulted in a gain or a loss. Each department's output for the week is costed at the factory standard costing, and against this is placed the departmental debit for wages paid and materials used. Even though comparisons by this method show that a profit has been made on the output as a whole, it is quite possible that there have been losses on some lines, such as small orders, that would not be disclosed.

The costing system of the factory should be so constructed that the factory-manager will definitely know each week what the operations in all departments are actually costing, so that he can give his attention to those operations that are costing more than the basic allowance.

It would appear that in some factories a fair attempt is made to ascertain the cost of the upper, but the same attention is not paid to the cost of bringing the shoe to completion. In regard to upper-making, clickers are required to show on a weekly sheet details of materials used and number of jobs done. The journeywoman operating the upper-closing machines also shows jobs done on a weekly-output sheet. In neither case do the workers show the time taken to complete each separate order.

In the bottom-stock, making, finishing, and dressing departments each worker's output is not recorded, nor is the cost of any of the operations recorded; consequently the departmental efficiency can only be judged in a general way by comparing direct expenses for wages, &c., with the output valued at rates shown on standard cost cards. By this method it is not evident when any operations are taking longer to perform than that allowed for when factory time was originally calculated.

At the present time labour charges amount to more than one-third of the total factory cost of making a pair of shoes in New Zealand, and when compared with English and American costs is obviously out of proportion. It has been authoritatively stated by one of the largest shoe manufacturers in America (*vide the Leather Trades Review*, 23rd January, 1929) that the average labour cost of a pair of shoes is close to 60 cents (2s. 6d.) per pair, and when it is considered that the average weekly earnings of the whole of the operatives in the American shoe industry is quoted at over £6 per week there is room for much improvement in New Zealand's manufacturing.

A close analysis of the individual operation times, made during this investigation, has disclosed that there is a great difference between the actual net operation times and assessed times as shown in factory costings. Even after allowing for setting up and adjusting machines, there is a great deal of lost time between operations, and its very existence points to the necessity of having a costing system that will uncover how much is being paid for non-productive labour and how much is lost due to low output from machines.

In the manufacture of a pair of shoes a large number of operations are necessary, and, as some of these only take seconds to perform, it would not be practicable to record the exact departmental times for each and every order that passes through the factory, because many orders are for such small lots. The factory efficiency can best be checked, and the cost of manufacturing any type of shoe can best be determined, by utilizing an "operation" costing system.

Before introducing an "operation" costing system it is first necessary to list all the different operations performed by each department, and assign to each operation or group of operations a distinguishing number. As illustrating this point the following statement is given:—

Cutting department—Operation No. 1, cutting outsides; No. 2, cutting linings, &c.

Machinery department—Operation No. 3, skiving; No. 4, branding; No. 5, solutioning; No. 6, edge-folding; No. 7, fitting; No. 8, seam-rubbing; No. 9, upper-closing; No. 10, trimming; No. 11, buttonholing and fastening.

Bottom-stock department—Operation No. 20, ranging and rolling leather; No. 21, cutting and preparing soles; No. 22, cutting and preparing insoles; No. 23, cutting and making heels; No. 24, cutting and making stiffeners.

Making department—Operation No. 30, attaching insoles; No. 31, inserting stiffeners; No. 32, puller; No. 33, side-lasting; No. 34, consol; No. 35, pounding; No. 36, staple-fastening; No. 37, removing lasts.

And so on.

Having completed the list of operations it is desired to keep separate, time studies should then be made of each of these operations on each of the main classes of shoes, so as to arrive at fair operation times per pair for ladies', men's, and children's boots and shoes. Having determined the operation times, it is a management function to see that in actual practice the times are not exceeded: any extension means just so much loss to the business.

Labour.—Each worker in the factory should render a weekly time-sheet showing the operations he or she is engaged upon each day, and time employed on each. The form may be made to suit the particular requirements of each factory, but should at least embrace the following:—

Day.	Pairs.	Operations and Number.	Ladies', Men's, or Children's.	Time worked on Operation.	Orders engaged upon.