

receive no training in the use of tools or the other practical features of their profession; they can hire mechanics at \$2.50, \$3 and \$4 a day to do that class of work for them.

An engineer does not need to be a bookkeeper any more than he needs to be a skilled mechanic in the several trades, but he does need to know the principles of accounting so that he can control and direct the keeping of the records of results as obtained in his work as an engineer, just as he needs to know how to direct the mechanic to obtain those results.

Certainly the engineer, if he is to advance in the line of industrial management, and that is what most of our competent engineers are now doing, must be capable of at least understanding the value of a system for correctly keeping shop costs. Without such a system the works manager is at sea. Records correctly kept determine along what lines to develop. I have in my examinations of industrial properties repeatedly discovered as the cause of loss, and sometimes of failure, a more or less complete deficiency in this direction. Sometimes companies which know in a general way as to the cost of production do not know the cost in detail, and so are unable, through an examination of their records, to determine the weak spots in their system. To decrease the cost of manufacture we must have correct records of cost for comparison, especially when different processes are being tried against each other. This fact is now coming to be well recognized, and there are a number of engineer accountants who make a business of working out systems of shop management, including the keeping of accurate shop costs, and who go farther, and from the records so obtained, locate the weaknesses in the shop itself. This calls for unusual ability, for unless the work is controlled by well-balanced men, men of sound common sense, red tape will be overdeveloped. Books are kept for the business; business is not run for the sake of bookkeeping. That is quite true, but it is also true that if we keep our book records with accuracy and prepare therefrom simple, comparative statements, we can often improve upon our shop methods. And so the bookkeeping becomes more than the simple recording of the results obtained—it becomes an active coadjutor in developing improved methods of manufacture and management. You may be disposed to acknowledge that the keeping of shop cost is of vital importance in securing efficient management, but you say why not use the service of these specialists—engineer accountants? I reply, the manager has no right to trust blindly to any one; he should at least be able to follow the adviser in the steps and methods he advises.

Furthermore, the specialist to do his work most efficiently must draw upon some one connected with the management of the works for information as to local and special conditions. What security can the manager feel in acting upon the comparisons furnished by a system of shop cost records if he is ignorant of the principles upon which that system depends?

There is a lot of nonsense taught to young men about the relative importance and dignity of being men of detail or broad gauged men of affairs. I have generally found in my experience—and it has been a wide one—that the man who boasts that he takes a broad view of affairs, leaving the details to others (who by implication are small in stature compared to him), is generally a man whose early training has been sadly neglected, and as he