

not. Some theory is necessary in order to arouse interest. Nothing, however, beats practice. Yet theory leads to practice, and that is the thing to strive for; in fact, go at it any way that will bring the knowledge home to you and success will eventually be yours.

Ripping waste will depend very much upon the nature of the specifications, and the widths of the stock available; one-piece parts that fit in nicely with the stock are usually quick-working propositions, and a wide run of stock is very helpful on style No. 1 boxes, i.e., where it fits the ends and sides closely, or being so very wide admits of ripping into tops and bottoms without waste. This is quite a factor in the execution of large contracts where the specifications are rigid; but where specifications are elastic enough to admit of two pieces in sides and ends, little waste need be made for these parts, or for cleated boxes, provided, always, that when T. & G. becomes a condition of manufacture then the width of stock absorbed in making these must be figured in, otherwise it will swell the waste per cent., and the effect of a strip of waste, say, one inch wide on a top or bottom 12 inches wide as compared with such strip on a part 30 inches wide, is a very different proposition.

Kindling wood has a value, depending on location, yet no boxman is anxious to furnish this on a basis of \$2 or less per M ft.; it is also a good thing under boilers and still no one is desirous to cut up lumber with the idea of shoveling it into the furnace; chips and sawdust have their uses for fuel and the surplus is frequently available as a source of income. The latter, however, may be said to cut no figure in regard to the waste problem.

Percentages all the way from 10 to 20 are named as the average for waste, and I find by correspondence that many beginners want an expression of opinion as to the proper waste on certain grades of stock. I am quite unable to give this information for the reasons heretofore given, and also because it depends so much on the method of figuring contents. Those who figure contents closely to cutting sizes are apt to have a larger average waste than those who figure fuller sizes in the estimate; hence, it's a good deal of "every man for himself," etc.

It has been said, there is no royal road to learning, meaning thereby, I presume, that there is no way by which knowledge can be accumulated other than by study, and this is true of the waste question in the box business, as well as of the other problems arising in that trade. It's a case of get in and dig in order to have the facts before you in such shape that they will guide you on your way to success. A little digging will create the desire to dig deeper, and it won't be long until facility in digging will come. A man may handle a spade awkwardly on the first attempt, but, like everything else that has to be learned, "practice makes perfect."

One thing is certain, the beginner in the box business must understand how waste is made before he figures on any large amounts of business. If he neglects this, his capital, whether it be money or energy, or both, will rapidly be impaired. It won't do to assume a percentage and then call his competitor names because some business is not forthcoming on his bid. He may feel reasonably sure that he was wrong in his point of view, and he ought to take such rebuff as an incentive to locate the cause.

#### PIECEWORK IN THE BOX MILL.

Piecework is not all faults and no favors any more than it is all favors and no faults. There are good things to be said for it as well as bad things about it. We have

already had some of its faults pointed out, wherein it has been shown that it has a tendency to concentrate attention on speed frequently to the sacrifice of quality. Also, it is said to lead to unnecessary waste of material, which is quite a serious objection. These are faults that it develops in different degrees, depending on circumstances and how the work is handled, but there is another side, and so let us look at that for a while and see how the favors balance up with the faults.

Piecework encourages not only physical effort, but also more thinking and planning on the part of those doing the work to devise ways and means of doing it more rapidly. This of itself is quite an item in the development, because people who are actually doing the work can frequently develop ideas and discover means by which the work may be facilitated that are not practical to the superintendent or proprietor, who is not so familiar with all the details. A specific instance of this kind is related by a man in charge of a cigar box factory, where the piecework system is the only satisfactory basis on which to do the work. The girls were paid so much each for doing the work of putting on hinges and pasting the labels on the boxes, and finishing them off. They discovered by-and-by that the pasting of the hinges made quite a break in the work for each one, and finally they evolved a scheme of employing someone to do the hinge pasting only. They figured out a piecework basis for this, and arranged means to pay for the work, each a certain proportion, and found it worked out advantageously, because the hinge pasting being done separately allowed them to work better, make better time, and more money and work uninterruptedly.

Piecework in the factory is in some respects similar to the commission basis for travelling salesmen. The good ones, those who can make quite a record, like it because it gives them the chance to get all they earn instead of being paid according to the average earnings of all. Not only that, but it stimulates both the good and indifferent ones to greater effort, and to harder thinking about how to get orders. Take the average salesman on the road, and if he is getting a straight salary he may do his work conscientiously and not run his expense account abnormally high, but put the same salesman on a commission basis and he very likely will reduce his expense account materially, and increase his sales. He will work harder and think harder because he feels that he is working for himself as well as the company, and he can see where he gets direct benefit for the increased effort.

The same thing is true in the box factory where men are working at piecework. The good ones not only like it, but it sets all of them to thinking of ways and means to increase their output and enlarge their income. There is an old story illustrating this point about a man who had a contract to nail up boxes of large size and special design, which couldn't very well be handled with a nailing machine. The proprietor figured out a piecework system of pay that would enable a swift worker to make fair wages, and by-and-by it was found that one old man, who was not very swift and hadn't at first made fair wages, was making more than anybody else. Investigation developed the fact that he had brought his boy with him, his boy had induced some of his chums to come, and in the end he had three or four boys for help. The boys were very quick, and after he got them trained in each of the boys did practically as much nailing as he could do. He paid the boys from \$3 to \$4 a week, and, as his own wages had been figured so he could make about \$10 a week, it was easy to understand how by paying these boys he had more than doubled the