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Introduction to Predetermined Costs

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**NATIONAL ASSOCIATION
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COST ACCOUNTANTS**

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Vol. V December 15, 1923 No. 7

**An Introduction to
Predetermined
Costs**

**BUSH TERMINAL BUILDING
130 WEST 42nd STREET, NEW YORK**

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An Introduction to Predetermined Costs

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Touche, Niven & Company,
New York City

BUSH TERMINAL BUILDING
130 WEST 42nd STREET, NEW YORK CITY

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NATIONAL ASSOCIATION OF
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National Association of Cost Accountants

AN INTRODUCTION TO PREDETERMINED COSTS *

An eminent authority has said that no cost system is worth what it costs which tells only what it costs to make the goods. The two-fold thought back of this statement is that cost is not conclusive as to value, and that management needs to know not only the amount expended in production but that every item expended is justifiable.

Cost is by no means indicative of value. It is not always possible to add a reasonable profit to the cost of manufacture and sell at that figure. Most manufacturers must sell at the market. Again in recurring periods of business depression the reduced volume of the product increases the cost, whereas the selling price usually declines. Of much greater importance is the fact that in these times of sharp competition management should know that no unnecessary expense is incurred in any process of manufacture, in the maintenance of the factory or in the conduct of the business. The cost system, therefore, must afford management every facility to control expenses and keep them within reasonable limits. To do this, the system must clearly indicate the elements that are controllable and those that are not. It must also bring this information to the management in time to take advantage of it and prevent unnecessary expense.

WHY PREDETERMINED COSTS ARE NECESSARY

The ordinary method of cost calculation, in which to the cost of material there is added the cost of labor and a proportion of the overhead, is inadequate to the present day needs of business. The final results are usually not found until after the product is completed, which is too late to reduce its cost and in the case of continuous process frequently too late to introduce adequate efficiency. Furthermore, if the cost is suspected or found to be too high to meet competition, it must be broken up into its original elements, and all the data reassembled to present a proper picture to those who are interested to know why goods cost more than the competitor's. In some cases the total cost in each department is charged as the material cost in the next department. Think of the labor involved to ascertain where and why the total cost of a product passing through many departments is excessive.

It is to avoid such an unhappy condition or to correct it where it exists that predetermined costs are employed. The system is not revolutionary in that it introduces entirely new methods of recording and collating cost data, but rather it is evolutionary in introducing new methods of handling what have been found by experience to be practical and efficient methods of recording production and cost details.

*This article is based upon a paper read before a meeting of the Ohio Society of Certified Public Accountants in Cleveland on October 13, 1923.

THEORY OF PREDETERMINED COSTS

Under this system, the cost accountant ascertains in detail what the product should cost and compares it with the actual expenses incurred in its production. This comparison is usually made by departments or operations, for daily, weekly, monthly or such other convenient periods as the needs of the particular industry may dictate. The procedure is based on the theory that under normal efficient operating conditions the product can be made for a stated sum, which can be readily calculated from known conditions, and that any expense incurred in excess of this sum is unnecessary—an economic loss, which it is the duty of management to eliminate. The cost records, if properly devised, will disclose these excesses, and often their causes. Management can then investigate and institute measures to eliminate the cause and reduce the cost. Thus the cost accountant and the factory management work hand in hand to promote the utmost possible efficiency.

A uniform pre-determined cost system cannot be outlined for all industries, nor indeed for all the factories in any particular industry. It must be adapted to the conditions of each factory and organization. In some cases comparison may be made by a simple system of records, particularly in continuous process operations. With a more complex product the cost data will be correspondingly complex. The problem of the cost accountant is to make the records as simple as the conditions will permit, and yet give management adequate information as to the conditions existing in every part of the factory.

The wage payment plan will often determine the extent to which the records can be simplified. For piece rates little or no comparison of labor cost is needed. If the operators are paid by the hour or day, then a comparison of the actual and predetermined cost is necessary. If bonuses and premiums are involved, provision must be made therefor.

PROCESSES IN A TEXTILE MILL

To illustrate the operations of a predetermined cost system I have chosen a textile mill making a single line of goods, but of many qualities and widths. The silk is bought in skeins and the cotton yarn in chains (loosely twisted rope of 300 to 500 strands of 10,000 yards each, coiled loosely in a bale). Both the silk and the cotton are shipped by the spinner to the dyer who stores the raw material, dyes to order, and ships to our mill as required.

In the mill the yarn is wound under tension on spools or quills about 8 inches long to be rewound into warps or used as filling. To make a warp, from 1,400 to 13,000 threads of quilled yarn of lengths varying from 750 to 2,000 yards each are wound on a reel, then rewound on a long spool or beam which is placed in the loom. The warp is the foundation for the fabric.

A simple fabric is made by the loom throwing a shuttle containing a quill of yarn called the filling between two parallel, horizontal rows of warp threads and at right angles to their length, the yarn in the shuttle unwinding as it moves through the warp. The two rows of the warp threads are then crossed over the filling thread like clasped fingers, holding it in place and forming a V through which another length of the filling thread passes, in its turn to be held in place by the crossed warp threads, the process being continued until the desired length of fabric has been woven.

A more complex fabric is made in the same general manner with important variations in details, as the number of filling threads, alternating colors, two or more warps on the loom, etc.

In the mill, what are in effect three warps are placed on the loom and two filling threads are woven into it. However, this style of fabric introduces no particular problem into the determination of cost.

The woven fabric is cut from the loom in lengths of approximately twenty-four yards each, inspected for imperfections, run through machines or otherwise treated by hand to bring out the desired qualities of "feel" and appearance, again inspected, measured and folded or rolled. Each piece is packed in a cardboard box.

The business is highly seasonal, the selling and shipping season lasting from about June 1st to September 15th. Goods are therefore made up in advance beginning January 1st at a low rate of production, which is increased as the styles are set for the coming season and with the anticipated volume of sales. From September 15th (the close of the selling season) to the end of the year production falls off rapidly as repeat orders are filled.

PREDETERMINED BASES FOR COST COMPARISON

This widely fluctuating volume of production with its corresponding fluctuations in the cost per yard presents a problem to which careful thought must be given. How shall we predetermine a basis of comparison that will serve equally well when costs are high and when they are relatively low, and also at all intermediate points? If many kinds of expenses fluctuate with the volume of production (not necessarily to the same degree, however), several bases of comparison could be set up, each to be used as its conditions obtained; for selling purposes, an average cost could be used based on the probable length of the high production season. Fortunately for us, the indirect expenses are fairly constant in amount, so our costs are predetermined from an average rate, it being anticipated that the over-absorption of expenses during the busy period will offset the under-absorption at the beginning and end of the season.

BILL OF MATERIAL

The first step in devising a predetermined cost system is the preparation of a bill of material for the product. Form 1 (see page 6) is a combined bill of material, cost data schedule

and cost calculation. At the top of the form are the general specifications of the loom and fabric. In the first three columns at the left are the specifications of the five kinds of material entering into the fabric, namely, the pile warp, the ground warp, the filling, and two kinds of edges, and the operations that are performed on each in the winding and warping departments. Below that are the operations of weaving and finishing. This part of the form is the bill of material. Specifications similar to this are prepared for each quality of velvet which is expected to be made and of new qualities as they are devised by the mill, by its competitors, or by the trade.

COST CALCULATION*

QUALITY BVD

6 pieces, 24 yards each, 16¾-17½ inches wide. Loom, Tonnar 3 wide. Reed 1,600,
Picks per minute 113. Gears: Take up, 67; Poil, 28.

		Quantity	Unit	Price	Material	Labor	Burden
POIL 5.6%	3966 Ends	200.50	Yds.				
Material	Can. org. 2P	6.04	Lbs.	9.25	55.87		
Dyeing	Color			1.40	8.46		
Winding				.33		1.99	
Warping		79.5183	Units	.038		3.02	
Burden	39.66%						1.99
WARP 5%	7990 Ends	26½	Yds.				
Material	Jap. org. 2P	1.60	Lbs.	10.20	16.32		
Dyeing	Blk.			.64	1.02		
Winding				.20		.32	
Warping		21.1735	Units	.031		.66	
Burden	39.666%						.39
WEAVING	(2 looms)	.24		.487		11.69	
Twisting				.0477		1.14	
Burden	55.9697%						7.18
FINISHING		.24		.1273		3.06	
Burden	70.9745%						2.17
GENERAL						22.63	
MILL BURDEN	45.216%						10.23
TOTAL					94.73		22.37
						22.37	
EXCESS MFG.						45.00	
COST	4.87%					1.10	
TOTAL					94.73	46.10	
				14	.84		
Boxes No. 60½		.6					
TOTAL COST					141.67		
COST PER							
YARD	144						
Gain .0154%	2.21						
	146.21						
		\$.96894					

Form 1

*Not all the cost items are shown in this form but enough for illustrative purposes.

From these specifications, tables of the operations to be performed in each department are prepared. Careful calculations are then made, by the mill management and the department foremen, of the length of time required to perform each operation on each quality (thickness) of yarn in the winding and warping departments, to tie in the warps to the loom, to weave a yard of fabric and to perform each finishing operation. Whether or not the operators shall be paid by the hour or at piece rates is also a question. The time required to perform each operation multiplied by the rate per hour, or the piece rate if one is set, is the predetermined cost of that operation. Next to the volume of production, this is the most important factor in the system, being the basis of comparison of the actual and predetermined cost of production as hereinafter described. It is entered in the fourth column of the calculation sheet, as are also the per pound cost of material and dyeing (done outside the mill).

The several details are then extended respectively into the material column and the labor column, and burden is calculated and extended into the last column. The total is brought down, the actual cost of manufacture in excess of the predetermined (to be explained hereafter) is added; the total cost is brought down and the cost per yard is ascertained. The form is then ready for the sales department's use.

In the cost department the total current actual cost is never calculated. Since the more important purpose of accounting is to keep costs down to a reasonable basis by eliminating unnecessary expense, the cost of the several operations is of greater significance, because if these are not excessive the total is reasonable. Accordingly, the actual cost of each operation or group of operations is computed only for the purpose of comparison with its predetermined cost in order that an intensive study or investigation may be made to ascertain the cause or causes of any excess and due measures prescribed to remove them.

ANALYSIS OF DIRECT LABOR

The operating period having been decided upon, which usually but not necessarily coincides with the payroll period, accurate records of production are kept and the labor cost of each production unit is calculated in the usual manner. The data for each unit are summarized, as in Form 2 (see page 9), which is an analysis of the direct labor cost of chain quilling (winding cotton yarn from the bolt of cotton strands to small spools or quills) in the cotton winding and warping department for a two weeks' period. A column is provided for each size or quality of yarn, and a total column in which costs only are extended. Production is posted from the summary of production. Actual cost is posted from the summary analysis of the payroll. Predetermined cost is the product of the predetermined rate and production. Excess or saving is the difference between predetermined and actual cost.

Amount of burden is the product of production times the burden rate.

If actual cost is less than the predetermined cost, the difference is brought down in black; if greater, the excess is entered in red ink to attract the management's attention. It will be noted in Form 2 that the actual cost in every instance exceeds the predetermined. Investigation disclosed that the excesses in the cost of production of the 24/1 and 35/1 qualities were caused in part by inferior quality of material slowing up the work. More significant is the fact that the total excesses for this operation were more than 1/3 of the predetermined cost. The work was done in a slack period in January when employees were creating work for themselves by deliberately slowing down production. Later under the pressure of high production the average as well as the skilled workers turned out more than standard production, making the actual cost less than the predetermined cost.

If piece rates are employed, there will necessarily be no variance. If a combined piece rate and bonus plan is in effect, the predetermined rate is the piece rate plus the probable bonus that will be earned. Under such a payment plan, the actual direct cost may be less than the predetermined in times of low production or with inefficient workers. Upon completion of the burden schedule, however, this apparent saving will be found to be more than offset by the unearned burden resulting from a low volume of production.

The duty of accounting for the variance between actual and predetermined cost, whether it be an excess or saving, generally belongs to the management. The cost accountant's responsibility will usually end when he has disclosed the variance. However, if it be possible to find in the records the reason for any part thereof, it should be disclosed in his reports. For example, in the weave shed in this same mill, each weaver operates two looms and the piece rate per yard is based on the two loom production. Occasionally, from causes beyond control, one of the looms will be out of commission, in which case to equalize the pay a higher rate per yard is paid for the production on the one loom. Accordingly, provision is made on the report for the weave shed to show what part of the excess is caused by one loom production. The other excesses must be accounted for after investigation by the management.

PURPOSE OF COMPARISONS OF ACTUAL AND PREDETERMINED COST

As showing how the comparison of actual and predetermined cost serves its purpose to direct attention to inefficiency, a case may be cited from the finishing department. From causes beyond the control both of ourselves and of the management, it was not practicable to devise an adequate system of production records in that department at the time it was deemed advisable to put the system into operation. Comparison, therefore, was made between the predetermined and actual cost of the production of the depart-

DEPARTMENT, COTTON WINDING AND WARPING
OPERATION, CHAIN QUILLING

PAY PERIOD ENDING, JANUARY 10, 1923

	24/1	28/1	30/1	35/1	40/1	50/1	Total
Quality	3.25	3.8	4.1	4.78	5.8	9.6	
Predetermined rate, cents.....							
Production, lbs.....	2,611.88	109.28		.36	733.75	56.25	355.50
Predetermined cost	\$ 84.89	\$4.15		\$1.48	\$35.07	\$3.26	\$34.13
Actual cost	118.03	5.97		3.65	51.43	5.17	38.54
Excess (red) ; saving (black) .		1.82		2.17	16.36	1.91	4.41
Earned burden:							
Rate, cents.....	1.75	2.05	2.21	2.58	3.12	5.17	
Amount	\$45.73	\$2.24		\$0.80	\$18.90	\$1.76	\$18.39
							\$87.02

Form 2

ment. A considerable excess being found, the department was broken into two divisions and the production of each recorded, with the result that excesses were found in both. Attention was then centered upon one division and particularly upon the shearing machines. When a length of the fabric is placed in the machine, the two ends are fastened together so that it can run between the shearing rollers in continuous operation as long as it may be desired. Each piece thus passes through the machine a stated number of runs according to the quality of the fabric, the higher qualities being given a larger number of runs. A comparison of the predetermined and actual cost of shearing showed the latter to be from two to four times what it should have been. The inspectors then found that the operators, who were paid by the hour, allowed each piece to remain in the machine until it had been sheared from thirty to forty times, or from eight to twenty times as long as was required, the purpose being to save themselves the work of removing the finished piece and putting in another. A system of production records was at once devised, and standard times for putting in the piece, for the shearing operation and for removing the piece were set by a competent rate setter. It was easily possible by this system of records to detect an operator spending too much time on his work.

In not all cases is the operator at fault. Much depends upon the quality of material. Low grade yarn breaks frequently, compelling the operator to stop the machine and tie the broken ends. Fabric woven from a poor quality of yarn will require more time and work in the finishing department. As the operators now know that the length of time they are spending on their work is reflected in the cost accounts, they quickly bring these defects to the attention of the management, thereby in many cases preventing the continued use of imperfect or low grade material.

BURDEN ANALYSIS

The indirect expenses also are compared with what is in effect a budget on forms similar to Form 3. (see page 11). The predetermined amounts are entered in the first column, the actual expenses for the period in the second, and the differences or variances extended into the third, excesses always in red ink to attract the reader's attention. Expenses for which the foreman is not held responsible (fixed charges and power, heat and light) are charged to the departments at the predetermined amounts. Variances in the production of power, heat and light are developed in an analysis of the power plant expense.

It will be seen that the department operated at only 60.75% of its rated capacity, its production being equivalent to only 1,251 productive hours, whereas there is a possible capacity of 2,059 hours. As a result of this subnormal production, the total expenses were \$28.20 less than the budget, but there was an excess of \$2.02 in the amount of sundry materials and supplies which the department foreman will be expected to account for.

BURDEN ANALYSIS
Department—Cotton, Winding and Warping
Two pay periods ending January 24, 1923

	<i>Predetermined</i>	<i>Actual</i>	<i>Variance</i>
Indirect labor	\$379.60	\$371.78	\$ 7.82
Repair department labor.....	19.25	3.62	15.63
Sundry materials and supplies.....	15.38	17.40	2.02
Supply room	32.51	25.74	6.77
Fixed charges	337.44	337.44	...
Power, heat and light.....	245.41	245.41	...
Total	<u>\$1,029.59</u>	<u>\$1,001.39</u>	<u>\$28.20</u>
Earned burden	625.48		
Unearned burden	<u>\$404.11</u>		<u>\$404.11</u>
Net variance			<u>\$375.91</u>
Productive hours	2,059	1,251	
% of actual 60.75%			

Form 3

But we are not interested alone in the amounts of the several classes of expense incurred, but also whether or not the total expense can be borne by the volume of goods produced—the problem of unearned burden.

The theory of unearned burden is that a certain amount of expense will be incurred in a stated time, during which period a certain volume of product can be made. If in any such period, the department operates at less than its rated capacity, only that proportion of the total predetermined burden has been earned that the volume of actual production bears to the rated volume. However, not all expenses can be reduced in the same ratio as the volume of production. Clerical help and caretakers must be available, though their time may not be fully occupied; other expenses also are more or less constant. With a subnormal production, the actual expenses incurred will exceed the earned burden. The excess is called unearned burden, and because there is no product to absorb it, it is economically lost. In the theory of predetermined costs it is actually lost and is so treated in the accounts.

Accordingly, in Form 3, below the comparison of actual and predetermined expense, the earned and unearned burden are introduced. Earned burden is calculated for each department by extending in Form 2 the volume of the product by its predetermined rate and carrying the total into the column at the right. The sum of the earned burden for all operations in the department is entered in Form 3, and the balance of the total predetermined burden is brought down and extended into the variance column, in which the net variances for the period are brought down, showing that the savings in the amount of expense incurred are offset by the unearned burden which should have been borne by the lost production, leaving a net variance of \$375.91.

We have considered excess burden as an economic loss. So are all other excess costs—excess labor, and excess indirect ex-

penses. To make this clear, let us consider the burden analysis in Form 3 as a statement of the total cost of the product, 2,059 units being the capacity of the plant and \$1,029.59 being their total predetermined cost, or approximately 50c per unit. However, in the period under review, only 1,251 units were produced at a total expense of \$1,001.39. Now, 1,251 units at approximately 50c each have a value of \$625.48; they are worth no more merely because it has cost more to produce them. Therefore, the 1,251 units produced are taken into finished goods inventory at \$625.48, and the balance of the expense of operation, \$375.91, is written off to profit and loss.

That it is not unreasonable thus to charge off the excess will be seen if we consider the results of taking the total cost, \$1,001.39 into finished goods inventory. If the total production, 1,251 units, were on hand at the close of the fiscal period and if they were then priced at their actual (market) value, 50c each, there would be an inventory write down of \$375.91, the same amount proposed in the preceding paragraph to be charged directly to Profit and Loss from the cost analysis. If a part of the production has been sold, a corresponding part of the excess cost will have been charged to the cost of the goods sold and the balance through the inventory write down. The direct transfer from cost analysis to Profit and Loss is preferred.

All the departmental reports for the current period are summarized on the "Summary of Mill Operations" and at the same time a cumulative summary of the year to date is prepared, both of which are shown on Form 4 (see page 13). The summary for the current period is usually the first report to be examined by the mill manager, who tentatively decides after studying it which department should receive immediate attention.

The details of this form probably need no comment, but the story it tells is interesting. Production reaches a volume far beyond anything that had been attempted in recent years; not only was the record for volume broken, but also that for the duration of the peak production. As a result, earned burden exceeded the predetermined as would be expected, and by the sum of \$6,835.86, in addition to which there were reductions in the amount of indirect expenses aggregating \$9,361.56. However, this favorable showing was more than offset by an increased labor cost resulting from the mill's inability to get skilled labor, and to train new operators adequately before they were set to work. The direct labor cost exceeded the predetermined by an amount more than offsetting the overearned burden, the economies usually attending an increased production not being realized.

Attention is directed to the item near the bottom of Form 4, "% to predetermine labor, 4.87%". This is the percentage that the net excesses bear to the total predetermined labor. It has already been referred to in the description of the cost calculation on Form 1. Near the bottom of that form, 4.87% has been added

to the total manufacturing cost, which is the excess for the year to date disclosed by the summary of mill operations. The excesses are not allocated to the several qualities of finished product that may be responsible for the increased cost; it would be impossible in many cases to sell them at prices that would show a profit. Accordingly, the total excesses are spread on a percentage basis over all qualities in the hope that the sales department may get a correspondingly higher return from all. This must be done if actual cost plus a normal profit is to be returned.

SUMMARY OF MILL OPERATIONS
for the 15 pay periods ended July 25, 1923

DIRECT LABOR:		Predetermined	Actual	Variances	
Department 1A		\$ 14,097.81	\$ 16,585.65	\$ 2,487.84	
Department 1B		13,493.08	15,874.21	2,381.13	
Weave shed		83,408.51	98,127.66	14,719.15	
Finishing Dept.		22,888.11	27,175.65	4,287.54	
Total		\$133,887.51	\$157,763.17	\$23,875.66	

BURDEN:		Analysis of variances Fluctuations Unearned in amount Overearned			
Department 1A.....	\$ 9,132.89	\$ 9,096.47	\$ 36.42	\$ 387.35	\$ 423.77
Department 1B	6,332.11	7,804.50	1,472.39	269.06	1,203.33
Weave shed	56,150.04	55,929.11	220.93	2,384.43	2,605.36
Finishing Dept.	34,093.51	22,884.24	11,209.27	9,627.33	1,581.94
General mill	73,881.80	67,678.61	6,203.19	2,775.07	3,428.12
Total	\$179,590.35	\$163,392.93	\$16,197.42	\$9,361.56	\$6,835.86
Net variances			\$ 7,678.24		
% to predetermined labor			4.87%		
Average number of looms	150	185			
% of increase			23.33%		

Form 4

Material cost also is equally subject to predetermination. The differences between predetermined and actual cost of material may be treated as a purchasing profit or loss. Some accountants recommend taking purchases into raw material inventory at the predetermined rates, carrying the variance from actual cost to a purchasing profit and loss account. It is more conservative for the purposes of the monthly statement to have material inventories stated at cost, and to charge the goods to process at predetermined rates, thus taking the profit or loss on purchases into income only as the goods are consumed.

GENERAL LEDGER ACCOUNTS

This leads us to the subject of general ledger accounts.

We have seen that predetermined factory cost accounting is by no means revolutionary. It further introduces nothing radical

into the general ledger, being subject to the usual control through general ledger accounts.

There are the usual inventory accounts, raw materials, supplies, fuel, finished goods, etc. They may be subdivided, either in the ledger itself or in subsidiary stock ledgers, as conditions in the factory and the desires of the management may dictate.

Control is maintained over the factory ledger by the goods in process account or by subdivisions to control material consumed, direct labor, indirect labor, and the principal classes of burden, to which are charged materials at predetermined cost (with the variance carried to purchasing profit and loss), labor at cost and burden at cost. This account is credited with finished goods at predetermined costs (with a corresponding debit to finished goods inventory) and with the variances disclosed by the comparison of actual and predetermined costs of operation, the latter being charged to variances, which is generally treated as an income account.

FACTORY LEDGER

The amounts charged to goods in process are distributed in the factory ledger to departmental sections with accounts for operations and qualities corresponding to the details which are the basis of comparison in Forms 2 and 3. These accounts are neither closed into total or process costs nor further distributed into quality costs. Therefore, it is not necessary to enter the credits for finished product. The factory ledger is only an analysis of departmental operations, agreeing in its periodical totals with the charges to the controlling accounts.

After each period's details have been agreed with the controls and posted to the sheets for comparison with predetermined costs, cumulative totals are brought down for the purpose of such reports on the operations of the year to date as may be desired. These totals for the year are a most valuable aid in setting the budget or predetermined cost of operations for the succeeding year.

The factory ledger must be supported, of course, by adequate production records corresponding to the cost details.

REVISION OF PREDETERMINED COSTS

The question will be asked, how often and when are the predetermined costs changed. The answer is, only when there is a permanent change in any element to a degree that will distort the comparison of actual and predetermined cost. A general change in wage rates will require a change in labor standards. An advance or decline in the cost of material not ordinarily subject to frequent market fluctuations should also be reflected in the material standards. Day to day fluctuations, even of large proportions, cause only purchasing profit or loss on current purchases. A permanent reduction in the volume of production, arising from adverse market conditions, is another occasion for changing the standard.

At the close of each fiscal year, a careful survey should be made of the operating conditions disclosed by the analysis of the year's expense, and if anything be found that is not clearly reflected in the predetermined cost, the change should be introduced. Necessarily, the probable conditions under which operations will be carried on in the coming year must also be taken into consideration.

With properly devised records, it is not difficult to introduce changes in the predetermined costs. The working sheets in which they were originally calculated should be filed in an orderly arrangement. When a change must be made, merely substitute the new element and complete the calculation anew from that point. On Form 1 (see page 6), the cost calculation, it will be seen how readily a new material or operation cost may be substituted with a corresponding change in only two footings. It will be seen also that this cost calculation is well adapted to basing selling prices on the current raw material market even though the predetermined cost be not changed. In the sales department's copy, the current market price can be substituted in the unit price column, extended into the material column, new footings brought down, and a new cost per yard computed. To this there is added the desired percentage of profit to get the current selling price. The cost department's standards are not changed because the advance in the current material market neither adds to nor detracts from the facilities which the system affords the management to control the cost of production.

The predetermined cost system is sufficiently flexible to meet all the requirements of managerial control. It gives ready access to all the details of the expense of operation. It brings out more clearly to both operators and management the principles on which scientific accounting is based. It can be installed with but little change in the general accounts, stock records and production statistics, and in the compilation, analysis and distribution of expenses. It provides a constant cost figure in the finished goods stock record, reducing materially the labor and expense of keeping a perpetual inventory. To revert to the opening thought, it is a cost system worth what it costs, because it tells vastly more than merely what it costs to make the goods.

Vol. II

- No. 7—Purchase Orders and Purchase Records, *Homer N. Sweet*
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