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Winthrop L. Carter

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## Industrial Management and Accounting \*

BY WINTHROP L. CARTER

The statement has been made so frequently of late that New England industry is permanently on the down grade that I welcome this opportunity of speaking to you on this subject. The unfortunate position of the textile industry in New England is probably largely responsible for this opinion. This situation has received widespread publicity. This has led to the general impression that the textile industry is synonymous with all New England industry. This is not so. It is one of the most important industries, but, in relation to the whole, represents less than one-third of our entire industrial resources.

From colonial times manufacturing has been the mainstay of our people. In the last government figures for the year 1933 the total value of industrial products for New England was three billion, seventy-three million dollars, the total number of workers employed approximately eight hundred thousand, and total industrial wages paid six hundred and eighty-five million dollars. This three billion dollar industrial income compares with a total of five hundred million dollars in the recreation industry and with two hundred and twenty-five million dollars derived from agriculture. Mining and quarrying and fisheries account for annual incomes of twenty-five million and fifteen million dollars respectively. Thus it is seen that industry is and continues to be the mainstay of New England's standard of living and the social values which rest upon it.

That our industry is definitely on the decline does not seem to be borne out by recent figures on the depression. These figures show that there have been less declines in values of manufactured products, less reduction in payrolls and fewer unemployed than in any other large, important geographical division of the country. Furthermore, there is a peculiar strength in the New England industrial situation, due to its diversity of product, the great number of its small and comparatively isolated plants and the stability and intelligence of its labor. Therefore, I am by no means pessimistic of the industrial future of this section of the

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country. I do recognize, though, very clearly certain fundamental things which must be done if we are to maintain our important industrial position, which has been the foundation of our prosperity in the past.

Our first job is to blow to smithereens the persistent, pessimistic utterances by broadcasting the facts. A very necessary part of this work is to make our many industrial communities conscious of the vital importance to them of the manufacturing establishments located in their areas. I suppose the most talked-of activity of every chamber of commerce is the search for new industry. There is always an active committee in every chamber for this purpose. If their efforts meet with any success, it is immediately headlined in the local newspapers. Yet, until the depression began to curtail and close down those industries these communities already had, they gave little or no attention to what the community could do to help the growth and development of their existing enterprises.

There are many specific things which can be done by a community to assist its industry. Remarkable tax savings have been achieved in centers where tax associations have been organized. Public recreational developments have contributed to the health and contentment of employees, resulting in more stable labor conditions. Good schools, zoning plans, adequate retail stores—in fact, anything which makes a city, town or village an attractive place in which to live, all indirectly contribute to the welfare of the industry there. Too often these objectives have been sought at the expense of the industry by high assessment and rigid and restrictive local ordinances. I am not referring here to state laws and regulations, but only to local conditions, for if real sentiment favorable to industry is developed locally the combined sentiment as expressed in our state legislatures will quickly follow the lead.

In one of our New England states there has been a definite downward trend for the past fifteen years, so that the value of products, the number employed and amount of payrolls represent today less than one-third of the total of a decade and a half ago. This situation developed unconsciously and insidiously, through a complete indifference on the part of the general public. Social legislation seemed to concern only employers and employees; it was not until factories closed and moved to other sections of the country or even to adjoining New England states that people in the professions, retail storekeepers, farmers and all the many

elements of the population directly dependent on industry awoke to the fact that these social laws were of just as much importance to them as to the industries they purposed to regulate. But it was too late then to change the trend which had become so definitely established.

New England as a whole has not suffered to the same extent. It is not too late for our people to arrest this trend so far as the industries of this entire section are concerned. Once the value of industry to all our people is clearly understood, the resulting spirit of coöperation will be of tremendous importance in favoring the development of this important factor in our economic life.

Now let me discuss what industry itself must do. Its greatest need, I believe, is to improve the quality of its management. There are no figures showing a mathematical relation of the ability of New England management as compared with that of other sections of the country, but that is unimportant. There are plenty of data indicating New England's backwardness in this important function. Too many of our formerly successful enterprises were family affairs. More attention was given to perpetuating the family fortune than to the vitality of the business. Boston is unique as a trustee city. One has only to read the directory of directors to see how much more attention is or, rather, was given to the division and distribution of the profits of these companies than to the production of those profits. For one man on the board trained and qualified to operate the company there were three or four with financial or fiduciary qualifications. The depression has wreaked fearful havoc with this method of management.

It was amazing to note in the applications received by the industrial advisory committee at the federal reserve bank how many cases there were of companies which had consistently made satisfactory profits for years back, but had apparently no realization that they were in a depression until the depression was several years old. They continued to pay the same salaries and dividends in the face of rapidly diminishing earnings. It was not until the second or third year, when their cash was depleted, that they took drastic steps towards retrenchment—too late to maintain adequate working capital.

I could give many illustrations indicating the reluctance of New England management to change established policies with the times. One might almost say they put more faith in a change in

the times to reestablish the efficiency of their rigid policies. They were great supporters of the return-to-normalcy theory. Unfortunately, there has been no such change and the depression took its inevitable toll.

Now, if we wish to continue in business a change in our management policies is necessary. We must change them fundamentally in two respects—labor relations and planning. Labor relations must be considered as a major function of our business. For years we have accepted as essential such functions as production management, sales management, credit departments, maintenance and repairs, finance, etc., but except in a comparatively few large companies the important human problem of labor relations has been entirely neglected. Doubtless this is because it is more abstract than any of those functions named above. But, the increasing numbers of social laws, both state and national, emphasize the importance of the labor aspect of management over the next ten years. The social security act, for instance, makes provision for unemployment and pensions. It places an enormous cost, payable in cash, on industry. This very cost puts a hitherto unknown premium on labor efficiency and production. Its effect will be to cut existing employment to the absolute minimum in every well managed industry. When the law requires you to pay a tax based on your total payroll, you will naturally try to keep that payroll at the lowest possible figure. It becomes of prime importance that your labor be selected with particular fitness for each respective job; that working conditions be of the best, encouraging a man to his ablest performance; that every cause of discontent, often developing because of indifference or ignorance on the part of management, be removed. Your workmen must be contented mentally as well as physically. It is a highly technical problem, involving health, psychology, justice and leadership. It can no longer be left to look out for itself.

The number of men qualified to head such departments and give management the facts needed is at the moment small. Men must be trained quickly and intelligently for this important task.

Management has for some time planned production schedules and certain other definite tasks. It has failed, however, to plan in any detail the major policies of its business. Sound planning is a combination of research and forecasting. Accountants can

be of great assistance in educating management to the value of planning. Accounting has too long been used merely as an historical record, instead of a means to penetrate and explore the unknown future.

When I was a boy we took long drives with horses through the White Mountains. We had a measurement device on the axle of our wagon which gave us the mileage we traveled. It was called an odometer. It gave us merely historical readings. Today every automobile is equipped with a speedometer, which accumulates the historical reading but at the same time gives a rate per hour, so one knows at any moment the accomplishment of his forward movement, by means of which he can accurately calculate when he will achieve his objective. The importance of this rating to a driver of a car on any long trip is clearly established from the habit of paying far more attention to miles per hour than to total mileage achieved.

Now, the great majority of our New England concerns are still using accounting in the odometer sense. It furnishes them an annual balance-sheet, performs the ordinary bookkeeping functions and produces various income-tax figures, if they are lucky enough to have one to pay. In a somewhat larger number of concerns it may also produce the cost of the product. But, taken as a whole, all the records produced are historical.

What has happened is over; but the future is always an unplayed game. Once management has become accustomed to using accounting as a calculation of the future, the figures of the past become routine and of little interest to the executives.

Successful planning is essentially dependent on factual data. The field in which such data can be obtained is much broader than most of our New England management realizes.

It is not my intention to make an efficiency speech. In the first place, I am not an efficiency expert, if there is such an animal and, secondly, I am concerned with broad management principles and not detailed systems.

Two things have stood out in the depression: first, the companies with the most flexible management policies have weathered the storm best, and, secondly, companies whose management correctly forecast the effect of various of the "new deal" laws on their particular business actually made a profit out of the new conditions, whereas some of their competitors, who simply met the situation as best they could after the event, made substantial losses.

Never was the need of charting our future course more essential than now. No man can predict with any certainty what the economic effect on industry of many of these new laws will be. There is one fact which is incontrovertible. It has cost a huge sum of money, and that sum must eventually be repaid by taxation. This load must be carried in large part by industry. So, in our plans for the future, we are confronted with the fact that for years to come our tax burden will be our greatest handicap to profits. We can not dismiss this problem by simply passing on the increased cost to the consumer. In the recent years which have passed, we have learned how quickly the consumer mobilizes and refuses to buy when the price is too high. Industry, therefore, is faced with the necessity of absorbing a good part of this tax expense. And the crucial problem is: How can it be done?

As an illustration only and without any expectation of covering the whole field of manufacturing expenses, I want to bring to attention the office functions. I have selected this particular field, as I believe it is the one in which accountants can give the greatest assistance.

*Office methods in general are far behind production methods in efficiency.* Office management is not as progressive, not as willing to accept new thoughts and ideas. It is my belief that this attitude prevents many accountants from applying to their work the vision it requires. Again, it is a case of too much history and too little forecast.

Bonus payment methods have only scratched the surface in office work. One hears such general objections to incentive wage systems as:

1. They make rushed work and therefore inaccurate work. This is not true. Steady workers are faster than quick moving, spotty workers.

2. They require exceptional types of workers. This also is not borne out by the facts. A study made by various office managers shows that 95 per cent. of the average office employees can produce satisfactorily on bonus.

3. Such systems produce a harmful pressure on the employee. Not if the plan is intelligently developed. It should even decrease pressure by removing the wasteful expenditure of energy. Routine functions become interesting because measured. The employee feels a new responsibility in being on his own. He starts work more promptly, reduces voluntarily non-productive

work to a minimum. Rest periods are compulsory, but length of period is at option of the employee.

4. Such systems can not be applied because office work requires thought which can not be measured. In illustrations I will give later, I prove beyond doubt that this is a fallacy.

So much for methods. Let us consider for a moment office equipment. Here again the office suffers in comparison with the factory. We must have the latest type machines in our factory to produce goods, but the same old types are good enough for the office.

1. Modern desks are very inefficient, as no person can work at one without an undue amount of stretching. Circular desks will some day replace the present type.

2. Until recently, to set tabulator stops on a typewriter it was necessary to reach over the top of the machine and set the stop in the back. The newer machines now have a key which when depressed sets the stop. This is much easier, quicker and therefore more efficient.

3. One of the most serious inefficiencies in practically every office is the transporting of papers. And how many thousand pieces of paper are handled in every office! If office work were regarded on a production basis, clerks and messengers employed for this purpose would long ago have been replaced by a conveyer system. Yet one of the large conveyer manufacturers told me the other day he did not know of a single office that had a complete mechanical system. The lost time in this antiquated method alone is from 50 to 70 per cent. of the total time of the clerks involved.

4. Costs—In the manufacturing departments costs are fundamental, but how many offices have any conception whatever of their production costs? What does it cost to write a letter, to enter an order, to send out an invoice? Surely the same principles for controlling expense apply to office work just as effectively as to manufacturing. The office has been taken for granted as a necessary evil. Instead it should be regarded exactly as a mill department—with the spotlight of cost examination turned on every department and detail.

I have another reason for examining office work as a typical illustration of what I think is wrong with management. I believe the type of mind that allows these conditions to continue can not do the kind of thinking business must have to meet the difficult conditions of the future.



I have stated principles which I know from experience to be facts. I don't wish to weary you with illustrations, but you might be interested in the results obtained in two or three office departments of our own company.

Stenographic department.—I purposely select this department because the routine, prosaic nature of the work will show best, perhaps, the possibility of instilling interest appeal—an important element in any wage incentive plan. The investigation began with a time-study survey, differing from the usual time-study, in that particular attention was given to the character of the task performed; that is, whether it was monotonous or if it had details of variety which provided interest and what methods the employee adopted either consciously or unconsciously to provide variety. Stop-watch readings were taken to determine standards. Such a survey takes considerable time. It must be spread over several weeks, to be sure the records are a true picture of normal operations and not an unconscious response to engineering observations.

Stabilizing output.—Among the interesting facts discovered was that a very uneven output existed, due to an over-extension of energies at certain times, followed by reactions distinctly below normal. All our dictating is done to machines. It was evident that the quality of the cylinders not only had a direct effect on the typist's output of any particular cylinder but also qualified what might be termed her potential performance. A poorly dictated cylinder produced a quite evident fatigue, which carried over to the next cylinder, thereby affecting the typist's production in spite of the dictation quality of the succeeding roll. Some girls made no physical effort to meet this situation, while others unconsciously selected these periods to leave their machines and recuperate.

Several remedies were applied. The dictation itself was studied. The dictators, some of whom were directors of the company, were rated on a quality basis by the stenographers themselves. The publication of this rating provided a stimulus for the dictators to improve their quality.

There was quite a difference in the technical qualifications of the typists themselves. It was found that some of the fastest typists under the old system completely fell down on a measured production basis, due to nervousness and emotional excitement. Each case of this character was studied individually. A repro-

ducing machine was equipped with a second listening appliance, so an investigator could listen to the actual performance of the work by the typist.

Throughout the development of the reorganization, the girls were kept fully informed as to the purpose of every study. Their interest in it was as keen as that of the management itself. This was very important, as it provided the coöperation throughout which was essential to the success of the plan.

Another change was made which further created interest on the part of the majority of the operators. Having formerly typed only the cylinders from one dictator, operators were unfamiliar with the language employed in other departments of the business, with the exception of two or three who could type with equal facility dictation from any department of the company. The entire group, therefore, was divided into three classes—those able to take dictation from any department were placed in class A; class B was established for any one who could take cylinders from any two departments; class C for those qualified for only one department. Different base rates were established, "A" being highest and "C" lowest.

These rates had nothing to do with output, but were established solely on a qualification basis—that is, ability to take dictation from one or more departments. It was then provided that any girl below class A could promote herself automatically any time to the next higher class by passing a suitable examination. The greater flexibility of the department in having operators able to take dictation from any department more than offset the cost of the automatic advance in base rates. The net result is best shown by the final mathematical results:

Output per operator before standardization—440 six-inch lines a day.

Output per operator after reorganization—1,440 six-inch lines a day.

Fatigue before standardization—an important factor, resulting in very uneven output.

Fatigue after standardization—practically eliminated as a production factor.

Hours of work before—very uneven, overtime a usual performance.

Hours of work after—almost mathematically standard, an over-all time of  $7\frac{1}{4}$  hours a day, actual operating time  $6\frac{3}{4}$

hours a day, with two 15-minute rest periods—in the morning and afternoon.

Quality—vastly improved on the new basis. Typists' income increased—25 per cent. Saving to the company—25 per cent.

Stenography represents the nearest approach to factory production in an office, so, as a contrasting illustration, see how the same principles worked out in the filing department. We had about the same experience with our files as a prominent New York concern. During prohibition days a man rushed into the office all out of breath and said, "Quick, hide these two bottles of liquor somewhere. The police are after me." The boss said, "Throw them in the files. Nobody ever found anything after it once got in them."

Filing was studied. How much time did it require to file a pound of letters? How much time was devoted to getting previous correspondence from the files? How seriously did the second task interfere with the first? These studies developed the facts on which a reorganization of the department was made.

All correspondence and filable material was collected the last thing every night from each person's desk. It was placed on a truck and weighed as it was sent to the filing room. This total weight was charged against the filing clerks. The department was then given an uninterrupted hour at the commencement of each day to "coarse file" this material: i. e., divide it alphabetically into special containers provided for the purpose. At the expiration of this hour the department was opened to receive requests for previous correspondence. The interruptions of these requests reduced the production function of the department to a minimum, for the clerks already had all the filable material sorted out. If a request came for previous correspondence, they simply laid down the correspondence they had in their hands, which they were transferring from the coarse file to the permanent subdivision file, on the particular drawer on which they were working, took care of the request and resumed their filing operation.

Time studies developed a rate of pay per pound of filing. We allowed the employees to keep their own records, which were checked in total against the number of pounds of material delivered each day to the department. The discrepancies between these two figures have been trifling.

The method has worked out most satisfactorily, resulting in an increase in earnings to the filing clerks of 23½ per cent. and a saving to the company of 22 per cent.

I have attempted to show in the foregoing the large savings which can be made by putting office work on a production basis.

There is another phase of the situation I will refer to briefly. Office work is regarded as service work. Time is a dominating factor. Production and shipments must not be delayed because office work lags behind. For this reason most offices are staffed to handle peak periods, which means that they are automatically over-staffed in valley periods. One of the most important functions of office management, therefore, is to level the peaks and fill the valleys. To accomplish this result, it is essential that accounting be used as an engineering medium. Not only must the proper entries be made on the books, but detailed knowledge must be available on how many entries are to be made and how long it takes to make each entry. It is then possible to set up a production quota per clerk, determining how many clerk-hours are required for the task. When these facts are known it is a comparatively simple matter to reorganize the office on a basis of staple output. The fluctuation in load is eliminated. The payroll is substantially reduced as there is no longer any need of staffing for peak periods. Service is improved, as it now rests squarely on exact measurements established with engineering precision.

While this procedure sounds simple, it is difficult to accomplish, because so many established precedents have to be overthrown. Accountants can help greatly in the education of management by emphasizing far more vigorously the engineering possibilities of their profession. They are still tied to a whole lot of established customs simply because they are established and not because of their merit.

I can recall my horror when our office manager said he wanted to discontinue sending out monthly statements. A study had shown that the majority of our customers paid and discounted their bills from the invoices, making no use whatever of the monthly statements. We sent a circular letter asking if the statements were of any value to them and had an overwhelming reply in the negative. To the comparatively small number who still made use of them, we continued to send the statements but discontinued all the rest. This netted a saving of several thousand dollars a year.

The first of the month is always a peak in an accounting department. We decided to shift the taking of our trial balances to the middle of the month, which was normally a valley. This was strenuously opposed by our chief accountant, simply because it had always been done at the first of the month. The change was made, and now no one would think of going back to the old practice.

If you could talk back to me at this point, I suppose some one would say, "What has all this to do with New England industry?" "Probably most of the industrial concerns in this section have so small an office force that it would be a waste of time to devote study to them." To this I agree, but again remind you that I have discussed these things in detail to illustrate management principles. I want our managers to turn their attention more to the future than the past; I want them to anticipate all the factors that will influence the prosperity of their enterprises; I want them then to analyze every one of these factors, whether it is in the field of community relations, labor relations or the detailed operations of their businesses; I want to impress on them the possibility of accumulating factual data on many problems they now believe to be abstract and impossible of calculation.

Sound management is largely a matter of making correct decisions, but correct decisions can not be made without the facts. Accounting is the keystone of our industrial structure. Let us make use of it also as the compass by which we chart our course. Teach management to use it as an engineering force to reduce to finite units the confused factors of complex problems. Many problems melt away and disappear when subjected to such analysis.

Then and then only will New England management throw off the fetters of the past, be alert, creative and forward looking. And with this change in attitude New England industry will forge ahead and again become the mainstay of our social and economic prosperity.