

# Industrial Relations and Social Security

## What Changing Productivity Means

By DON ROWAT

SINCE the close of the war, both in this country and in the United States, the argument that wages cannot be increased until production per worker has increased has become popular as a new point of reference in judging the justification for wage demands. The result has been a sudden desire on all sides for information as to changes in production per worker for the nation as a whole, for manufacturing, or for this or that particular industry.

In the United States, for example, the Bureau of Labor Statistics' indexes of changing productivity were seized upon by both management and labour as the final arbiter in wage questions. Figures improperly understood and misapplied, however, can do amazing tricks. On the one side, elaborate charts were drawn to prove that wages had gone out of sight while productivity showed only a mild upturn; on the other, equally convincing charts indicated a limp upward turn for wages, while productivity had gone out of this world. But neither side bothered to indicate whether they were talking about wage rates, average wages, or real wages, or whether it was productivity in civilian industry, in all manufacturing, or for the total economy. This, of course, is an exaggerated picture, but it gives the general idea.

The trouble here is partly that those who argue a case tend either deliberately or unconsciously to misuse statistics. Statistical agencies could help here by insisting on publishing with each series or chart a short paragraph on what the figures mean. But the trouble is also partly that the agencies themselves often have no clear idea of what the figures mean or what their limitation of use-

fulness are. Thus the term "labour productivity" is an extremely hard fly to swat, and the experts in the United States are still arguing about whether productivity did or did not increase during the war. For this reason the U.S. Department of Labor last October held a conference representing experts, government, labour, and management in order to explore more fully the meaning of the concept and to discover which measurements should be used for which purposes.

The outcome of the conference was, in general, to emphasize the fact that productivity is a very complicated concept, particularly in its relationships to wages, profits, prices, and full employment. In particular, insoluble difficulties lie in the way of using measures of changing productivity as infallible formulae in industrial relations. Indeed, their most useful application lies in other, more general, fields.

In Canada, no satisfactory measures have as yet been worked out. But since a demand for them has already been made in connection with industrial relations, it is important to explore not only their meaning and usefulness but also their limitations, as a result of experience elsewhere.

## Measures and Their Uses

### Over-all Measures

In discussions of full employment and higher living standards what is meant by increasing productivity is greater national production relative to the amount of work done. And if we could find some way of expressing the amount of goods and services produced per working man-hour (or year) this year as a percentage of some previous year, we would have our concept of the increasing productive ability nation reduced to precise quantitative terms.

The problem of working out such a measure, however, is actually two steps

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more difficult than that of estimating national income. For not only must the value of all goods and services produced be adjusted in some manner to take account of changes in the value of the dollar, but also some way must be found of adding up all the work done in the nation in terms of either man-years or man-hours. However, as more experience is gained at estimating national income, and as the period of time covered by the Labour Force Survey's estimates of working hours lengthens,<sup>1</sup> it may be possible to work out a fairly reliable measure based on man-hours.

Indeed, it can be argued that even a crude one would, for some purposes, be better than nothing. The National Research Project in the United States, for example, constructed such a measure for the years 1919-1935, and though the roughness of the raw material and techniques used made it unreliable for year-to-year changes, it did form the basis for valuable conclusions as to general trends. Thus it was found that while about 146 units of the nation's output were being produced in 1929 for every 100 in 1920, only 16 per cent more man-years of work were employed.<sup>2</sup> Obviously, a finding such as this is a significant, if rough, indication of the nation's capacity to absorb employment at a given level of output.

More recently, Solomon Fabricant of the National Bureau of Economic Research has completed a study covering a longer period (1899-1939) in which he estimated the average increase in national man-year productivity to have been at the rate of 1.9 per cent per year.<sup>3</sup> And S. Maurice Livingston has used this type of information to predict what the national product must be to employ

fully the labour force that will be available in 1950.<sup>4</sup>

In Canada, a similar measure of increasing productivity would be not only of interest for comparison with the United States but also of direct interest to the Department of Reconstruction and Supply in its attempts at forecasting national income and employment. Its usefulness in the immediate future for short-term forecasting would, of course, be limited. Not only are the data and techniques used in projecting national income too rough for an adjustment of 1 or 2 per cent per year to be of any consequence, but also the wartime dislocation of our economy means that peacetime trends in productivity could not be applied with any degree of confidence to the present transitional period.

### Productivity by Industry

The type of measure just described would be useful in studying and predicting long-term trends in the nation's productivity. Hence, even a crude one based on dollar values may be better than none at all. But if our aim were to predict future employment requirements in a particular industry or to provide information about production per worker in the type of situation created by industrial conflict over wage demands, far more accurate measures based upon changes in the *physical* volume of production would be needed.

Any attempt to measure productivity by industry however, is surrounded by extremely difficult problems of both concept and execution. In the first place, firms and industries usually produce several products. This means that we must find some way of expressing changes in the latter's joint production per unit of labour. But how? The idea of an increase in physical production is simple, but to reduce it to the measurable terms of "How much?" is by no means easy. If last year 10 radios and 5

1. A quarterly survey based on the sampling technique begun by the Dominion Bureau of Statistics in the fall of 1945.

2. Weintraub, D., "Statistical Problems in the Relationship Between Production, Productivity, and Employment," 1937, N.R.P. of the Works Progress Administration, 20 pp.

3. Fabricant, S., "Labor Savings in American Industry, 1899-1939," Nov., 1945, N.B.E.R., 39 pp.

4. Livingston, S. M., "The Measurement of Post-war Labor Supply and Its Capacity to Produce," *Journal American Statistical Association*, March, 1945.

washing machines and this year 12 radios and 6 washing machines were turned out with the same amount of labour, we know that productivity has increased—but by how much? What if 11 radios and 4 washing machines had been turned out? There seems to be no perfectly logical escape from this dilemma of trying to relate labour units to incomparable products. However, in attempting to work out at least approximations to our ideal, a number of approaches can be taken.

### Productivity by Product

One approach might be to try to skirt this problem by restricting the study of productivity to one product at a time. But any attempt to produce a quantitative answer about a particular product in the real world becomes exceedingly complex.

In the first place, we would be trying to compare a product in one period with the *same* product in another. Although given the same name, that of today may be entirely different in quality from the one produced several years ago. A simple example is the automobile. In the second place, the average worker applying an hour of labour today may be much less skilled than the one who applied it ten years ago. Because of the time and effort saved in training labour, this may represent a net gain to the economy. In other words, the hours compared, like the products, may not be comparable. However, in view of both the manner in which statistics are traditionally collected, and the impossibility of making a quantitative adjustment for such intangible changes, a productivity measure must largely ignore them.

We must also know how many hours were worked in producing the product under examination, in each time period. But it is almost impossible to discover how many hours were devoted to a certain product. In modern industrial society, where division of labour and multiplicity of product are the order of the day, it is typical for men to be working on mater-

ials at only one stage in the productive process. Their work ultimately results in several completed products. And information relating labour to product can only be gathered in terms of numbers of workers or hours of work done in an establishment or industry making related products.

### Productivity by Sub-products

We could, however, restrict our study still further by redefining our unit of production as a sub-product or sub-stage of the productive process (e.g., number of collars sewed per hour in the sewing department of the shirt industry). This might give us valuable information as to causes of changes in productivity in particular situations. Such a survey, however, would have to be on a case-study basis, since it could not make use of existing statistics, and would run into innumerable problems of comparability, definition, and measurement—especially over a period of time, since production processes are constantly changing. In any case, it would do nothing to solve the central problem of answering the more generalized, yet vital, question as to whether, and how much, productivity is increasing for a group of related products in a firm or industry.

## THE ATTEMPT TO MEASURE PHYSICAL PRODUCTIVITY BY FIRM OR INDUSTRY

### The Problem of Weighting

To return to this important question then, some way must be found of reducing the products to homogeneous units so that changes in the volume of individual products may be translated into a change in production for the group as a whole. This requires some criterion for judging the relative importance of changes in the individual products. An increase from 8 to 10 in the number of washing machines, for example, may be more important than an increase from 6 to 10 in radios. But what is the criterion? The problem is like that of asking: How

much larger is one house than another? A variety of answers might be given, depending upon the uses to which they are to be put.

From the point of view of labour productivity the relevant criteria obviously are either total work done on the product or total value added to the raw material by that work. But which? For estimating labour requirements, work done is the desired criterion. In constructing a composite production index for comparison with changes in labour used, then, we wish to give greater relative importance to changes in those products or firms which employ the greatest number of man-hours. If, however, our interest were to centre on the relationship of spending to employment, as it does in the over-all measure, then the value-added criterion would be the more appropriate.

Most indexes of the physical volume of production (like those of the National Bureau of Economic Research and of the Federal Reserve Board, and the like Dominion Bureau of Statistics' indexes of industrial production and manufacturing), use the value-added criterion in combining industries and groups of products. Hence, to arrive at an index which would be useful for estimating labour requirements it would be necessary to construct a separate one using labour weights. The National Research Project, for example, attempted to do this in its study of 59 manufacturing industries.

In the real world, however, as in trying to relate labour to a product for measuring its productivity, it is impossible to discover the amount of labour devoted to a particular product even for weighting purposes. In fact, it is usually impossible even to discover the value added to a product. Hence, substitute weights must usually be resorted to.

Since adequate value-added and labour figures are usually available only on an industry (or firm) basis, the most important difference between existing physical production indexes whose weights are based respectively on the concepts

of value and of labour requirements, then, comes in combining production indexes for industries (and sometimes firms) into over-all indexes. Thus, even though the National Research Project purports to use labour weights<sup>5</sup> and the National Bureau to use value added<sup>6</sup>, as far as the weighting of individual products is concerned they are forced to use similar methods and hence get almost identical results for individual industries. In this case, unfortunately, identity of result is no mark of reliability.

### The Changing Composition of Production

Another factor which must be taken into account in measuring the joint increase in productivity for a group of products is the changing composition of production. Changes in their combined productivity may result from changes either in the productivity of each product or in the relative volume of output of each. We may desire to eliminate the latter factor in order to measure only the over-all change due to actual changes in the productivity of each. We may, however, wish to take account of that factor when changes due to it become permanent and substantial. Otherwise our measure would be meaningless because it would give a distorted picture of the real world.

Our choice here must depend upon our judgement as to whether we think the rise in the production of, say, washers relative to autos is a permanent change in a definite direction, and not random. The N. R. P. study worked out productivity indexes both ways for comparison. In the one case it used weights based on the 1929 composition of production, and in the other, weights based on a changing composite. The former gives an idea of the amount of labour required in 1935 to the assumption that when the 1929 volumes of production were again re-

5. "Production, Employment, and Productivity in 59 Manufacturing Industries, 1919-1936," by H. Magdoff and I. Siegel, N.R.P., May, 1939, 2 Vols.

See Fabricant, *Op. Cit.*, footnote p. 4.

sumed, the composition would revert to one similar to that of 1929.

### The Changing Degree of Integration

So far (except for the use of value added in weighting) we have been talking as though a measure of the products turned out by a firm or industry were the same thing as a measure of its production. But the latter is usually both something more and less than the production of a single product. A firm may turn out several products, yet actually only have partially turned them out in the sense that it has taken raw materials and worked them up to the final stage. In judging the productivity of firms and industries, then, what we wish is a physical measure of their productive contribution to the products. And what we are attempting to measure is the productivity of a *stage* of the productive process.

If the stages of the productive process were to remain at all times fixed, we would be safe in assuming that changes in the physical volume of the products turned out measured changes in the production of a particular stage. And this is what most measures (like those of Fabricant and the N. R. P.) are forced to assume. But what if over a period of time the scope of the firm's or industry's processing of the product shrinks to include less of the productive process? Our measure of the number of workers used would shrink accordingly, but our measure of production in terms of physical products turned out would not change to take account of their decreased production. Hence, our measure of productivity would give an inflated picture of the actual change in productivity. Similarly, an extension to more of the productive process would give a deflated measure.

The logical solution to this problem would be to measure productivity only for a given stage of the productive process. But in the dynamic modern world processes change so rapidly over time that such stages never stay "given". Not

only is the degree of integration of industry itself constantly changing (for example, the inclusion of the parts-making processes in the auto industry), but also stages in the productive process become transformed in a host of subtle and indefinable ways. The growth in services performed by new plants and firms and the introduction of new machines are examples. These mean that work which was formerly done in the industry or on the job is now done elsewhere. A measure of changes in the physical volume of products, then, cannot be taken as an adequate measure of the physical production of a firm or industry.

In fact, the question even arises as to whether there can be such a measure. What we really desire is a measure of the changing production added to the raw materials. And seemingly the only criterion one can use here is one based on value. If we had a measure of the changing value added to the final product by the stage of the productive process with which we are concerned, then we would have an idea of the firm's productive contribution to the final products. But without adjustments for changes in the value of the dollar it would not be in terms of *physical* production per unit of labour. Hence, the only feasible approximation to our ideal at present is to measure changes in the volume of individual products and to assume that this is a measure of the change for a firm or industry even though adjustments cannot be made for changes in the degree of integration.

### THE MEANING OF PRODUCTIVITY

From all of the foregoing it is not hard to see what extreme difficulties surround any attempt to arrive at a precise productivity measure of the sort necessary to deal with the specific questions that arise in the field of labour relations.

It is equally important to realize that the type of measure we have been discussing, which relates physical production to work done, tells us nothing about the

causes of changes in productivity or the relative and changing contributions of capital and labour. Unfortunately the term "labour productivity" is something of a misnomer. Immediately it gives the impression that any change indicated by a quantitative measure is solely due to the changed efficiency of workers. But industrial society is so complex and interdependent that our measure can be nothing more than an indication of the net result of the inter-action of a host of factors. To attempt their precise isolation is to set oneself an almost impossible task because of the difficulty of separating one situation from the interdependent whole. The National Research Project, for example, after a three-year study of the cotton-garment industry, in a report of some 130 pages reached the rather obvious conclusion that the main cause of increasing productivity was the installation of the straight-line system of production. The study did, however, give some idea of the magnitude of this causal factor as compared with others, and was no doubt of value from that point of view. But to attempt from existing statistics to divine the specific contribution of labour as such would be a complete impossibility.

Productivity may change as a result of changes not only in the efficiency of individual or groups of workers but also in technology, plant lay-out, managerial technique, degree of utilization of capacity, in raw materials, or the quality of the products manufactured; it may also change as a consequence of the mortality of inefficient and old plants or of a shift in production between plants producing at different productivity levels. Over the short term it is influenced by a host of additional factors: temporary idleness caused by faulty scheduling, material shortages, design changes, conversion of facilities to production of other goods, accidents or strikes in subsidiary industries; hiring of labour for training; hoarding of workers; wastage of labour on rejects and partial wastage on salvage, and so on. In one situation one factor may predom-

inate; in another, another. American studies, for example, show that in sugar beets, productivity is related mainly to size and age of plants; in bricks, to per cent of capacity used; Hence, our port-manteau measure is bound to obscure many economic factors.

For the purposes of making decisions in specific situations the analysis of wage-cost-price relationships requires information far more comprehensive and at the same time more precise than this measure could hope to supply. Examples of the types of question asked are: is productivity in this industry likely to increase in the future? Is it increasing faster than in other industries? If so, should the workers here necessarily get the benefits in higher wages; or should the benefits go to other workers via lower prices? In other words, to whom or what should the increase in productivity be attributed? Information on these points—as to not only where and in what proportions the benefits of increased productivity have gone but also whence they came—is needed before one can hope to make a completely rational judgment as to how they *ought* to be distributed.

This is not to say that productivity measures should not be attempted. Even though an index of changing productivity would be unreliable for short-term changes and specific situations, would do nothing more than measure the net effect of a host of factors, and could not pretend to answer questions as to causes, it *would* be of value in raising pertinent questions. If, for example, it indicated a spectacular rise in productivity during any one period, it would immediately raise the question "why?" and at the same time indicate the point at which we should begin if we wished to proceed with a more elaborate case-study type of analysis. Although in itself it explains little, it would be an important point of departure in economic analysis, and would at least help to increase one's understanding of the total situation for either an industry, a group of industries, or the nation.

## FULL EMPLOYMENT THE GOAL OF INDUSTRY.

J. S. WILLIS

THE December issue of *Public Affairs* carried an excellent article "The How of Sound Labour—Management Relations" by Mr. M. H. Hedges. If the principles advocated by Mr. Hedges are accepted by both employers and employees, there need be no strikes in 1947. Differences will be settled on their merits. Both parties to a collective bargain will seek to discover what is right rather than who is right. "Both labour and management," as Mr. Hedges wrote, "will profit by placing the industry and the nation first."

While clothed in different phrases, the "Approach to Industrial Relations" adopted by the Canadian Manufacturers' Association at its annual meeting held in Toronto, June 4th to 6th, 1946, sets forth a program which is very similar to that advocated by Mr. Hedges. This official manifesto of Canadian industry deserves more attention than it appears to have received. Its text is as follows:

### An Approach To Employee-Employer Relations

The Canadian Manufacturers' Association, Inc., regards a high standard of living for all Canadians as the chief objective of Canadian industry. The Association believes that a high standard of living in Canada depends upon maintenance of a high level of production.

A high level of production, however can be maintained only if industry supplies consumers with satisfactory goods at prices which will encourage a high level of consumption both at home and for export. To do this is the prime function of Industry.

If this function is to be successfully performed, there must be a fair return in the form of gross earnings from which wages and dividends may alike be paid.

For the successful performance of this function, there must also be suitable plants, equipment and machinery; sound management; and a working force willing and able to perform the many and various duties necessary in modern manufacturing operations.

But even with all these, the successful functioning of Industry can be assured only by full and harmonious co-operation between employees and employers.

To promote full and harmonious co-operation, the Association believes that the following principles should govern relations between employees and their employers.

### A. Both Employees and Employers Should

(1) Regard continuity and quality of service to the public (the customer) as the first consideration. Upon it depend year-round jobs, good wages, dividends, and the future of Industry itself.

(2) Observe faithfully the provisions of every agreement or undertaking made by them or on their behalf.

(3) Seek constantly to discover methods of increasing production and improving products.

(4) Consider with open minds proposals made by either party to the other, each seeking to understand the other's needs and problems, and constantly bearing in mind that neither can operate without the assistance of the other.

(5) Settle differences by negotiation in good faith without interruption of operations

### B. Employers Should

(1) Provide facilities which will permit efficient and economical production and make all reasonable provision for the safety and health of their employees during the hours of their employment.

(2) Select and develop supervisors who are not only technically competent but who will deal on a fair and friendly basis with the men and women whom they supervise.

(3) Respect the right of employees to associate freely for all lawful purposes.

(4) Bargain collectively, in cases where representatives have been freely chosen by a majority of the employees affected, or wages, hours of work, and working conditions.

(5) Organize operations with a view to promoting maximum regularity and continuity of employment and consequently maximum stability of income.

(6) Give employees, as far as possible, opportunities to progress within the organization according to ability, experience and merit.

(7) Support and develop good wage standards having regard to all circumstances which are material.

### C. Employees Should

(1) Recognize the Employer's right to plan direct and manage the business.

(2) Perform their assigned duties in an efficient and industrious manner to the best of their ability.

(3) Cooperate freely with management in meeting the many problems in which the employees are concerned.

(4) Conserve and protect the products, plant equipment and machinery, and respect the rights, of employers as the owners of the property.

(5) Recognize the right of an individual employee to join or not to join any lawful organization of employees or other citizens without impairing his right to work at the occupation of his choice.

This "Credo" of Canadian Manufacturers is a point blank repudiation of the old fashioned and outdated conception of labour as a commodity. It recognizes the interests and rights of the working force in all matters affecting its welfare. It affirms freedom of association. It welcomes joint and frank discussion of matters of common interest.

In common with Mr. Hedges, however, the Manufacturers' pronouncement goes farther than recognition of community of interest between employees and their employers. It also affirms the responsibility of both industrial partners to serve the public. It accepts as axiomatic that full employment is the first desideratum of industry.

Whether the ideas of Mr. Hedges and of the Canadian Manufacturers' Association will govern negotiations between employers and employees in 1947 is a matter of grave concern to every Canadian. Public interest in better labour management relations was evidenced last summer by appointment of a joint Parliamentary Committee to look into the causes of industrial unrest in Canada. The report of that Committee was one of the most significant documents which have appeared in this country since the end of the war.

The cool reception with which the proposal for continued or increased government intervention in industrial relations was received by both employers and employees is encouraging, as it suggests confidence on both sides that better labour-management relations are possible on a voluntary basis.

In the words of Judge Goldsborough however at the trial of Mr. John L. Lewis in Washington last December, "Society has a right to protect itself

against cold, hunger, nakedness and social disintegration." If the partners to industry, or either of them, in a selfish search for wealth or power, seriously interrupt the program of full production, an attempt to restrain them by legislation seems inevitable.

Democracy is possible only in states in which a majority of citizens of their own volition respect the public interest. It presupposes an intelligent appraisal of facts, and a willingness to work for the common good. It operates by use of lawful and constitutional means. The events of 1946 have focussed the spotlight on industrial management and leaders of organized labour. In 1947 they will be on trial before the bar of public opinion—not in Canada only, but the world over. Before enunciating any program, therefore, it will be in the interest of both to ponder seriously what is due to primary producers, to consumers and to peoples of lands desolated by war. In a world so full of misery, so short of the elementary needs of subsistence, and hovering on the brink of possible new conflicts, forcible imposition of selfish demands would be a sorry spectacle, discreditable indeed to the whole democratic way of life. The stakes are high. They far transcend any temporary advantage which may be expressed in terms of increased wages or higher dividends.

What the future holds is of course obscure. A new year will bring new problems. There will be various opinions as to how these problems may best be solved. There will be difference of view as to how the national income should be divided. Everyone is likely to feel that he is getting the heavy end of the load, and a smaller share of the reward than he deserves. Such thoughts are natural. Probably they are inevitable. But the differences which derive from them are never insoluble, if met in a spirit of tolerance and good will. As Mr. Hedges so well remarks: "The sine qua non of successful management relations is the *will to make cooperation work*,"