INTERNATIONAL LABOUR OFFICE

HIGHER PRODUCTIVITY
IN MANUFACTURING INDUSTRIES

GENEVA
1954
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INTRODUCTION

Practical methods of increasing productivity in manufacturing industries were discussed by a meeting of experts held under the auspices of the I.L.O. in December 1952. The experts, who are listed in Chapter VII, attended the meeting in their capacity as experts and not as representatives of particular groups or interests; but, in order to ensure the presence of men thoroughly familiar with the points of view of governments, employers and workers, they were drawn from government or independent circles, employers' circles and workers' circles in countries in which manufacturing industry is highly developed or is in process of rapid development.

The meeting unanimously adopted a statement of conclusions which has since been considered by the Governing Body of the I.L.O. With a view to ensuring that these conclusions receive the widest possible circulation among all whose initiative and cooperation can contribute to raising productivity the Governing Body authorised their communication to governments, with the request that they be brought to the attention of employers' and workers' organisations, productivity centres and other interested bodies; it also authorised their communication to the International Labour Conference (at its 36th Session in June 1953), to inter-governmental organisations concerned with raising productivity and to the International Committee of Scientific Management.

These conclusions are reproduced as Part III of the present report.

To assist the meeting in its deliberations the International Labour Office had prepared a report entitled *Practical Methods of Increasing Productivity in Manufacturing Industries*, which has not been published. The experts also had before them a published I.L.O. report entitled *Factors Affecting Productivity in the Metal Trades*, which had been prepared for the Metal Trades Committee of the I.L.O.¹ Parts I and II of the present report are based, in the main, on the unpublished report prepared for the meeting of

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experts. Substantial new material has, however, been added and in revising the original text the Office has had the benefit of the views and comments of the experts on the two reports submitted to them. The Office would like to acknowledge its indebtedness to the experts, without, however, attributing to them responsibility for anything that is said in Parts I and II of the present report.

These parts of the report are arranged as follows. Part I deals with general conditions affecting productivity. Chapter I discusses briefly the concept of productivity and its relation to welfare. Chapters II and III discuss certain psychological, economic and institutional factors influencing the general environment within which industry works.

While it is important to do everything possible to bring about and to maintain a psychological and economic climate which favours the rapid growth of productivity, it is in individual establishments that this growth has actually to take place. Part II accordingly deals with steps which can be taken to raise productivity within individual establishments. A good deal of space and emphasis is devoted to questions which are of special interest and concern to workers and to the I.L.O. Chapter IV is concerned with plant and equipment, Chapter V with the organisation and control of production and Chapter VI with personnel policy.

The report thus lists and discusses a large number of factors all of which appear to have some influence on industrial productivity. It has, however, little to say about the relative importance of these different factors, which is bound to vary from country to country and from industry to industry. This is a matter on which it is dangerous to generalise. As some indication of factors which have proved to be important, it may however be noted that the following are mentioned as factors responsible for high productivity in the United States in more than half of the 58 team reports of the Anglo-American Council on Productivity: a spirit of competition (33), extensive use of mechanical aids (43), economic handling of materials (33), good lay-out of factories, offices and stores (30), modern methods of costing (36), production planning and control (36), work study (33), progressive attitude of management (30), and appreciation by workpeople of the need for higher productivity (43).

American leadership in the field of productivity and the productivity of labour in United States manufacturing industries appears commonly to be from two to five times as great as in Europe and many times as great as in underdeveloped countries.
possibility that lessons learnt in the United States may fruitfully be applied elsewhere, with due regard to differences in underlying conditions, account for the fact that more space is devoted in this report to experience in the United States than would normally be devoted in an international report to the experience of any one country.

The distinction between the factors discussed in Part I and in Part II corresponds to a distinction between “external” and “internal” factors affecting productivity drawn by Mr. Graham Hutton in his recent book, *We Too Can Prosper.* And, as Mr. Hutton points out, the two sets of factors interact; a company will react to external factors in various internal ways. Nor is this all. Effective internal action can make a powerful impact, through its example and its consequences, upon the external environment.

While this report is especially concerned with problems of raising productivity in manufacturing industries, and while all its illustrations are drawn from this field, much of it is equally applicable to other fields of economic activity. This is especially true of Part I, but is scarcely less true of much that is said in Part II. All types of economic activity—industry of all kinds, agriculture, office work, even domestic work—can become more efficient through the application of certain common basic principles.

To speak and write about productivity is worth while only if it leads to action. But action on matters affecting so many different interests commonly requires agreement. The principal significance of the meeting of experts whose conclusions are reproduced in Part III lies perhaps in the proof it gave that men of knowledge and goodwill from different countries, with different backgrounds, different experience and different approaches to the question, can reach the same conclusions on problems that have so many controversial aspects. The present report is published in the hope that it may help to carry a stage further the very necessary process of reaching agreement on what needs to be done in order to raise productivity in manufacturing industries and elsewhere.

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PART I

PRODUCTIVITY AND THE ENVIRONMENT
CHAPTER I

THE MEANING AND IMPORTANCE OF PRODUCTIVITY

The Meaning of “Productivity”

Few words are made to do more work at the present time than “productivity”. It is formally defined as the ratio between the “output” of wealth produced and the “input” of resources used up in the process of production. But this definition is formal only; it lacks content until “output” and “input” have been defined. Each of these terms can be defined in many different ways, none of which is necessarily the “right” one. Different definitions are legitimate, and indeed necessary, for different purposes. This has the inconvenient result that two people both talking about productivity may be talking about quite different things.

In a broad and fundamental sense the problem of increasing productivity may be said to be the problem of making more efficient use of all types of resources in employment—of using them to produce as many goods and services as possible at the lowest possible real cost. This implies a broad definition of both output and input. The concept of output will include all goods and services which satisfy wants—not only industrial and agricultural products but the services of doctors, teachers, those engaged in shops, offices, transport undertakings and other “service industries”. Input, when “productivity” is used in this broad and fundamental sense, will mean the efforts and sacrifices of all those who contribute to production.

This, however, is a somewhat abstract concept; and it is statistically unmeasurable, since the efforts and sacrifices involved in production are varied and impossible to add together.¹

¹ Even if, in the last analysis, all efforts and sacrifices involved in production can be reduced to labour and “waiting” (somebody has to “wait” or defer consumption every time labour which could have been used to produce consumers’ goods is devoted instead to capital formation), this still leaves the problem of adding units of labour to units of “waiting”. There

[Footnote continued overleaf.]
It is possible, by relating output (in the broad sense defined above) to the input of a particular factor of production—labour, land or capital—to arrive at a concept which is, if one is willing to make some rather arbitrary assumptions, statistically measurable and which may be called the productivity of that factor of production. While the concepts of the productivity of land and of capital equipment are very important for certain purposes, the concept of the productivity of labour has received the lion's share of attention in recent times—so much so that it has been suggested that "when the word productivity is used without further qualification, the productivity of labour is understood".\(^1\) The productivity of labour in an economy as a whole is the ratio of total output to total labour input; the productivity of labour in a particular industry or plant is the ratio of the output of that industry or plant to labour input in the industry or plant.

It is scarcely necessary to say that to speak of the productivity of labour is not to emphasise the efforts to be made by labour, but the importance of making an efficient use of the services of labour. In the expression

\[
\frac{\text{output of wealth}}{\text{input of labour}}
\]

it is the numerator that one wants to increase, not the denominator. Employers, workers, and governments can all play their part in increasing output, and the use of the term "productivity of labour” are, of course, great difficulties also in adding together the heterogeneous goods and services of which total output consists. This can be done, though with no more than an approximation to accuracy, by adding together their money values, corrected as far as possible for changes in prices (see I.L.O.: Methods of Labour Productivity Statistics, Studies and Reports, New Series, No. 18 (Geneva, 1951), especially pp. 75-77); and it might be suggested that a similar procedure should be adopted for aggregating inputs. On the input side, however, a problem arises as to how profit should be treated. In so far as profit is a reward for enterprise or risk-bearing which would not have been forthcoming but for the hope or expectation that profits would be earned, it is as much a necessary cost of production as wages or interest. In view of their residual nature there is, however, no sense in treating total profits actually earned in any period as a measure of the amount of enterprise furnished during that period. If all profits are treated as costs, the total value of input will by definition equal the total value of output. If, on the other hand, all profits are excluded from costs, the total value of input will fall short of the total value of output by the amount of profits earned, and the output/input ratio will be a measure not of physical productivity but of profitability. And there is no means of knowing what proportion of profits actually earned should be treated as costs. Another difficulty in the way of arriving at any meaningful aggregate of inputs is the fact that the rate of interest, influenced as it is by monetary and banking policy, is a thoroughly artificial “price” for the use of capital or the service of “waiting”.

THE MEANING AND IMPORTANCE OF PRODUCTIVITY

in no way implies that what workers can do to increase output is more important than what employers and governments can do. Still less does it carry any suggestion of a desire to exploit labour—quite the reverse. It shows a concern not for higher output at all costs but for higher output in relation to labour input.

This concept of the productivity of labour, though in some ways of less fundamental significance than the concept of the ratio of output to the input of resources in general, is a relatively simple concept in that the difficulties of adding together unlike things are reduced if we relate output to labour input alone. Moreover, this concept is of special interest if one is thinking of the economy as a whole and of the contribution that higher productivity can make to social progress. Provided those in employment remain a constant fraction of the total population, an increase in the productivity of labour in an economy as a whole means an increase in the amount of wealth produced per head of population. The concept of the productivity of labour is also of considerable importance in connection with wage policies.

Though the input of labour is a simpler concept than the input of resources in general, even the input of labour may be thought of in different ways. If it is taken to mean the amount of effort put in by workers, it follows that an increase in output produced at the cost of correspondingly greater effort will not be regarded as an increase in labour productivity. The amount of effort put in is, however, an exceedingly difficult concept to measure. For statistical purposes it is usually necessary to fall back, as a measure of effort, on man-hours, man-days, man-weeks or man-years. For certain other purposes, too, it may be useful to think of labour input as the amount of time rather than the amount of effort devoted to working. For example, output per man-hour or per man-week in the economy as a whole has a close connection with the question

1 Even so, there remain the problems of expressing different kinds of labour in homogeneous units.
2 It should, however, be borne in mind that the most labour-saving methods of production are not necessarily the most economical, even for an economy as a whole, if they demand heavy capital investment, i.e., much "waiting". The labour devoted to capital formation is of course included in the input of labour if one is thinking of the productivity of labour in an economy as a whole; but different methods of producing the same output utilise different amounts of capital and therefore require different amounts of "waiting".
3 Considering not the world as a whole but a single country, the amount of wealth produced in any year (which, given the size of the labour force, depends upon the average productivity of labour) has, however, to be adjusted to take account of payments to or from other countries, before it can be identified with the amount of wealth becoming available for use in that year.
of how far average hourly or weekly wages can be raised without giving rise to cost inflation.

But though the productivity of labour (however the input of labour is defined and measured) is of considerable significance in relation to an economy as a whole, it is much less significant, and may even be seriously misleading, to relate the output of a particular establishment, industry, or sector of the economy to the input of labour in that establishment, industry, or sector. For the productivity of the labour engaged in any particular establishment 1 may be increased by purchasing components or partly processed materials instead of raw materials from elsewhere, or by installing capital equipment which may be thought of as "embodying" labour from elsewhere in the economy (as a farmer may increase his output by using a tractor); in other words, not all the labour which should properly be regarded as having contributed to the output of a particular establishment 1 is in fact counted. In principle, this difficulty may be overcome by relating labour input not to the gross output but to the net output of an establishment or industry, i.e., to the value added (at constant prices) to materials, components and semi-finished products purchased from elsewhere; but allowance would also have to be made for depreciation of capital equipment. 2 The practical difficulties of measuring net output are, however, usually even greater than those of measuring gross output, and allowances for capital depreciation are bound to be arbitrary.

Although, for certain purposes, it is sometimes important to focus attention on the productivity of labour, there are then dangers in doing so. There is not only the danger of being misunderstood and being thought to place undue emphasis upon what can be done by workers to increase production. There is also the danger of giving insufficient attention to problems of what can be done to increase production by making a more efficient use of other factors of production. In industries where labour costs are low in comparison with material costs and capital costs, attention may need to be given primarily to economising materials or fuel or to making better use of machines. In underdeveloped countries, especially, the shortage of capital and land and the abundance of labour are often such as to make it more important to increase output per machine or per acre of land than to increase output per worker.

1 Or industry, or sector of the economy.
THE MEANING AND IMPORTANCE OF PRODUCTIVITY

For purposes of the present study, then, the problem of productivity will be thought of in the broader sense as the problem of utilising as efficiently as possible all types of resources in use. To readers who have got into the way of thinking of "productivity" solely in terms of the productivity of labour, the scope of this report might seem more properly defined by some such term as "productive efficiency in manufacturing industries".

PRODUCTIVITY AND WELFARE

Higher productivity is not an end in itself but a means of promoting social progress and strengthening the economic foundations of human well-being.

The resources needed for raising the standards of living of the less well-to-do sections of the community may be made available in any country—

(1) by devoting to this purpose—and especially to wages and social services—a larger proportion of the national output of wealth; and

(2) by enlarging the national output of wealth—

(a) by promoting a higher level of employment (where there is less than full employment); and

(b) by promoting higher productivity, or a larger output per unit of resources already in employment.

There are reasons for devoting special attention at the present time to the contribution which higher productivity can make to economic and social welfare. In most countries the mitigation of extremes of wealth and poverty is already an accepted goal of social policy. This goal is not always pursued very wholeheartedly, and there are many countries in which much more could probably be done to bring about a fairer distribution of wealth. The extent to which welfare can be increased by cutting the cake of the national income into more equal slices is however limited both by the size of the cake (which is in many countries much too small) and also, probably, by the need for maintaining adequate incentives to work, save, lend and undertake the risks of business enterprise.

In many developed countries there is little scope at present for increasing production by raising the level of employment. But in
some of them, and in many underdeveloped countries, present levels of unemployment and underemployment are such as to offer a substantial opportunity for expansion of output by setting unemployed or underemployed resources to work.

What can be done to increase economic welfare by redistributing income and by securing higher levels of employment, though important, is subject to limits which have been more nearly approached in some countries than in others. What can be done by increasing productivity is not limited in the same way. While higher productivity is likely to make only a gradual impact on the total output of wealth, and is certainly no panacea, so far as can be seen opportunities for improving methods of production are likely to continue indefinitely. Higher productivity is important in all circumstances; in the circumstances of many countries today it is the most important, though not the only, way to higher living standards.

But higher productivity, though essential for economic and social welfare, is not enough. Higher productivity creates the means and opportunity for improving the standard of living of workers, as of all other sections of the community; but it does not automatically and inevitably do so, at least in the short run. In general and in the long run, it is true, there is a good deal of evidence that the standard of living of workers is fairly closely related to the level and growth of productivity. It is in countries with the highest productivity of labour that workers' standards of living are highest. And there appears to be no tendency in the long run for unemployment to be highest in countries in which technological progress has brought about the most rapid increases in productivity.

Any programme to raise productivity must, however, take account of workers' fears (a) of working themselves out of a job, and (b) that employers will get all the benefits from higher productivity. To ignore these fears would be to invite failure. In the short run technological improvements may lead to unemployment in particular plants and industries, though they will usually at the same time create new opportunities for employment elsewhere. And though in the long run real wages do rise with increases in labour productivity, in the short run there appears to be no clear tendency for real or money wages to move up or down in accordance with changes in productivity from year to year.

Many workers also fear that higher productivity may be sought by methods which involve speeding up the rate of work, increasing
workloads or in other ways impairing working conditions or reducing the satisfaction which workers get out of their work.

It is, therefore, of the utmost importance that action to raise productivity should be accompanied by appropriate employment policies, by appropriate policies to ensure that the benefits from higher productivity are fairly distributed through higher wages or lower prices, or both, and by safeguards to ensure satisfactory working conditions. Such measures are essential in order to ensure that increases in productivity are rapidly translated into improvements in economic and social welfare, but they are to be regarded not so much as measures which should accompany action to raise productivity but rather as integral parts of programmes to raise productivity; for, unless workers are reassured on these points, their indispensable co-operation cannot be expected.

No less important are questions of industrial and human relations 1—especially the role of labour, at the national, industrial and plant level, in the implementation of programmes for higher productivity. The co-operation of workers cannot be expected unless they are consulted and, if possible, enabled in some way genuinely to participate in such programmes. Joint consultation is important for the contribution it can make to removing the fears and misgivings regarding higher productivity which have been mentioned above. It is important also for its own sake, as a recognition of what is due to workers as human beings, and as a means of giving them a greater interest in the undertaking in which they work and of encouraging them to co-operate with management in measures applied to raise productivity. Emphasis needs to be placed, however, not only on the importance of consultation and co-operation with labour but also on the fact that it is management which is responsible for the operation of an undertaking and for the decisions involved in discharging this responsibility.

The problems of social and economic policy and industrial and human relations that need to be solved if a rapid growth in pro-

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1 To stress the importance of good "human relations" in industry is not to suggest that employers should display a paternalistic or benevolent attitude. It is to stress the importance (apart from formal machinery for labour-management co-operation suggested by the term "industrial relations") of a good day-to-day relationship between all the people (workers, supervisors and members of the management) working together in a particular undertaking. See I.L.O.: Human Relations in Metal Working Plants, Report II, Metal Trades Committee, Fourth Session (Geneva, 1952) and the resolution on human relations adopted at the Fourth Session of the I.L.O. Metal Trades Committee. (Industry and Labour, Vol. VIII, No. 6, 15 Sep. 1952, p. 266.)
ductivity is to be achieved, and if this is to be translated quickly into improvements in social conditions, are almost certainly more formidable than the problems of industrial engineering. At least they are more controversial. Moreover, many problems which seem at first sight mainly technical or economic have in fact a very large psychological element. Even on these controversial questions, however, there would seem to be a considerable measure of common ground between far-sighted employers, workers and governments. It is in the common interests of employers, workers and governments to seek to define and extend the area of agreement, and to find fair and workable solutions to these problems—solutions which need not, of course, be the same in all circumstances and in all undertakings. Until such solutions are found, psychological obstacles will continue to impede technical progress, which could be extremely rapid if apathy, mistrust and suspicion could be overcome. The next chapter is accordingly devoted to a more detailed examination of these problems, and this report as a whole devotes a great deal more space to what may be described as human factors affecting productivity than to technical factors.

1 Cf. the following passage from The Times, 23 June 1952: “It is almost fair to say that at this stage re-equipment and improvement of machinery are not primarily technical problems. They depend first on training in proper methods of work study, secondly, on applying them in such a way as to break down the worker's psychological abhorrence of the man with the stopwatch, and thirdly, on negotiating the redistribution of workers—which may mean anything from another machine a man to a second shift... At every level, success or failure in winning labour's confidence are paramount; and they seem to vary widely.” (Quoted by Hutton, op. cit., p. 216.)
CHAPTER II

ATTITUDES OF MANAGEMENT AND WORKERS

THE PSYCHOLOGICAL CLIMATE

Opinions differ regarding the importance to be attached to psychological factors affecting productivity. The view which regards productivity as depending almost entirely upon the amount of capital employed and the productive techniques used is apt to take for granted a willingness to accept changes and to adopt new and improved techniques which is certainly not found in all societies.

... In many human societies ways of doing things remain unchanged for centuries and departures from established procedures are either forbidden by law or impeded by a superstitious adherence to custom. An attitude which accepts the desirability and the practicability of technological change is an essential prerequisite to progress.¹

Much can be done to improve the psychological climate in individual undertakings even if the generally prevailing climate of opinion in a country does not provide a favourable environment. Such efforts are, however, likely to be much more successful if generally prevailing attitudes favour innovation and if managements and workers take pride not only in their standards of quality and craftsmanship but also in their output.

This kind of attitude appears to be more widespread in the United States of America than in most other countries.

The one factor which more than any other has made for the high productivity of the U.S. is the attitude of its people towards work. Management and workers take an intense interest in output and efficiency.²

This quotation might have come from the report of almost any of the productivity teams from European countries which have

² ANGLO-AMERICAN COUNCIL ON PRODUCTIVITY: Letterpress Printing (London, 1951), p. 6. (In subsequent footnotes the Council is referred to by its initials, A.A.C.P.)
recently visited the United States. The United Kingdom steel foundry productivity team, for example, believed that "the fundamental causes" of high productivity are "mainly psychological", and regarded technical and organisational factors as the means through which a fundamental psychological drive toward high productivity found expression. The team reported that—

First, last, and all the time, managements are actuated by the belief that high rates of production are essential to individual and collective success. First, last, and all the time, workers at the bench, at the machine and in the offices subscribe to that same belief.2

These favourable attitudes towards productivity in the United States are no doubt due in large measure to the emphasis that is placed upon competition in the American way of life, and to the strength of United States trade unions, which are, in general, confident of their power to secure for workers a reasonable share in the benefits of higher productivity. The productivity-consciousness which is described in productivity-team reports is reflected also in collective bargaining provisions in a large number of United States industries3, and is evi-

2 Ibid., p. 29. Among numerous other reports which emphasise the favourable psychological climate prevailing in the United States as a factor making for high productivity, mention may be made of the reports of teams from the French machine tools industry and the Netherlands lithographic industry. See Association française pour l'accroissement de la productivité: Mission aux Etats-Unis de l'industrie de la machine-outil (Paris, 1951), pp. 28-29; Contactgroep Opvoering Productiviteit: Nederlandse Lithografen in Amerika (with a summary in English), p. 99.
3 See United States Department of Labor, Bureau of Labor Statistics: Collective Bargaining Provisions: Union-Management Cooperation, Plant Efficiency, and Technological Change; Bulletin No. 908-10 (Washington, 1949). The following are some of many examples of collective bargaining provisions reflecting a high degree of productivity-consciousness:

"The union recognizes the need for improved methods and increased output to make goods available at lower costs, and agrees to cooperate with the company in suggesting and introducing methods for increasing production, and in educating its members on the needs of such methods, changes, and improvements." (p. 5.)

"It is recognized mutually by the union and the company that increased wages must be offset by increased productivity in order that the company may be kept in such a competitive position to enable it to provide the employees with high wages and an improved plane of living." (p. 7.)

"The company has the right to determine job procedure and methods and to put in technological improvements and the union will cooperate in any work to improve plant operations." (p. 36.)

"The union pledges itself to encourage efficient operation to maintain production at its highest level, and that it will not interfere or oppose the introduction of modern methods and machinery." (p. 36.)
dently a major factor making for high productivity in the United States.\(^1\)

Many of the most important advantages possessed by the United States in the field of productivity (such as the size of markets and the degree of mechanisation of production) cannot be matched in other countries, at least for many years to come. There is, however, no physical reason why a climate of opinion as favourable to productivity as that which prevails in the United States should not be created in other countries where higher productivity is in fact much more urgently needed.

The first step towards creating a psychological climate favourable to productivity is an understanding of the importance of increased productivity in the common interests of employers, workers and consumers. This in turn requires the establishment of confidence that the gains from higher productivity will be fairly divided. It seems to be generally recognised in all sections of United States society that it is only because their productivity is high that Americans are able to enjoy a high standard of living.

Great efforts have been made in many countries in recent years to promote productivity-consciousness. These efforts include the sending of productivity missions to other countries and especially to the United States, the publication of productivity-team reports, publicity campaigns by members of teams on their return to their own countries, the organisation of special training courses and conferences, the establishment of national productivity centres, and the publication of journals devoted to productivity. In Eastern European countries “Socialist work competition” movements have been organised, with the aim of promoting rivalry and competition between individuals, teams and groups of workers, and stimulating the sense that each has a significant part to play in the progress of the industry in which he works and in building up the national economy. The trade union movements in the

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\(^1\) Even in the United States it is certain that the energy and quality of management vary a great deal from one undertaking to another, and it is doubtful whether productivity-consciousness and a spirit of enthusiastic co-operation by workers in the introduction of new methods and machinery are as universal as an incautious reader of the series of productivity-team reports might suppose. For evidence that attitudes less favourable to productivity are also widespread see W. Campbell Balfour: "Productivity and the Worker", in *British Journal of Sociology*, Vol. IV, No. 3, Sep. 1953, pp. 257 ff. There are also collective bargaining provisions forbidding, restricting or regulating the use of specified tools, equipment or appliances, or the introduction of new processes, equipment or machinery (Bureau of Labor Statistics: Bulletin No. 908-10, op. cit., pp. 36 ff.).
various countries are closely identified with these work competitions and have special responsibilities with regard to them.

Conditions of full or nearly full employment in many countries, coupled with labour shortages in many important industries and with balance-of-payments difficulties, have helped to bring about in recent years a wider understanding of the basic fact that standards of living do depend upon levels of productivity. But, if this is more widely understood than it has been in the past, it has probably still not become part of the thinking of the ordinary man and woman in most countries.

Nor is it enough to be persuaded that higher productivity is in itself a good thing. It is also necessary to be convinced that productivity is more desirable than certain other things that are also desired and that may have to be sacrificed to it. Some very pertinent questions were asked in the steel-founding productivity report quoted above. Similar questions should perhaps be asked and answered in other industries besides steel founding, and in other countries besides the United Kingdom. The questions were—

Is higher productivity really desired [in the industry]?  
Over what features in the ... industrial system does the desire for high productivity take preference?  
Is high productivity more important than the organisation and customs of the trade association?  
Is high productivity to be sacrificed so as to retain intact the existing methods of the employers’ organisations?  
Are trade union practices, built up over the years before the present economic dangers, to remain unaltered, at the expense of high productivity?  

An unwillingness to give up accepted ways of doing things, and a consequent resistance to change, is one of the most universal of human characteristics, and action to promote productivity cannot be effective unless it is based on an understanding of the reasons for the inertia or resistance that is so frequently encountered among managements, workers and all other sections of society.

Energy and a receptiveness to new ideas on the part of management are of cardinal importance. If management lacks these qualities, there is little that workers for their part can do to raise productivity. If these qualities of management are lacking, it may be because managements lack training and familiarity with

1 Steel Founding, op. cit., p. 35.
better methods. Or there may be a fear on the part of managements that co-operation with workers or governments in programmes to raise productivity will involve interference in the running of their businesses. Or the administrative structure within the undertaking may be such as to stifle enterprise. A number of productivity teams have drawn attention to the emphasis that is laid in American industrial administration on \( a \) the clear definition of responsibilities and \( b \) the delegation of authority.

... As the individual manager, whatever his level, knows his responsibilities and the limits of his power, he feels a freedom and a confidence that let him get on with the job. This is one of the main reasons for the vigour of American management.\(^1\)

Or, again, managements may be reluctant to give up the ease and security which they may associate with time-honoured methods and procedures, and with marketing arrangements which blunt the edge of competition. New capital and enterprise are often kept out of fields where they could be productively employed—kept out by means of monopolistic practices and restrictive devices, open or secret, resorted to by established firms in such fields. To exclude new men, new methods and new ideas in the interests of established producers in any field is to inhibit progress and to check the growth of productivity.

The attitude of management can be strongly influenced by the adoption of appropriate governmental policies in regard to raw material supplies, availability of capital, taxation, foreign trade and the regulation and control of monopolistic practices—policies which will encourage and reward a spirit of enterprise. Though such policies may greatly affect the psychological climate, they are, in themselves, matters of economics rather than of psychology, and can more appropriately be discussed in the next chapter. The leadership that can be given by the more enterprising managements in any industry is also of great importance. Restrictive business practices cannot always be controlled by government regulation alone; much depends upon the willingness of employers and their organisations to adopt progressive policies. And a few enterprising managements in any industry can do a great deal to improve the quality of management throughout the industry not only by compelling their competitors to become more efficient on pain of losing business but also by their example, by encouraging...

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joint industrial research and exchange of information between firms, and in other ways.\(^1\)

Energy and a receptiveness to new ideas on the part of management need to be matched by a willingness on the part of workers to accept new methods of production, even if these lead to some displacement of labour, and to abandon any restrictive practices they may have sought to maintain in the past. Particular trade unions in particular countries have been and are charged with impairing productivity by restraints on technological improvements in processes and machinery; by insisting upon rules requiring the performance of unnecessary work or the hiring of unnecessary men; by imposing restrictions upon job content, incentive systems, disciplinary measures, allocation of work, the use of prefabricated products or components, hiring and firing and sometimes promotion and demotion. Such allegations are not always well founded and not always free from malice. Trade unions have often had imputed to them the responsibility for restrictive practices whose roots lie deep in human nature and which have long preceded the organisation of workers into unions. But no unbiased observer will maintain that allegations of this kind are always without foundation.

In cases where there is some foundation for such allegations it is important to examine and understand the reasons underlying the attitudes and behaviour complained of. Union attitudes and behaviour towards measures to raise productivity vary enormously not only from one country to another but from one union to another within the same country. Among the factors which influence the attitudes and behaviour of trade unions are—

(1) The historical experience of the union itself.

Generally speaking, a record of struggle against the management is not conducive to a spirit of co-operation on the part of the Union, because, whenever a conciliating move is contemplated, someone will stand up and bring back the bitter memories and experience of the past. For that very reason the old traditional industries have often a greater handicap than the new industries. This is especially true in regard to old but contracting industries which have a long record of unemployment and low wages in the past.\(^2\)

(2) The attitude and behaviour of employers.

(3) The extent to which union members are satisfied with

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\(^1\) Cf. pp. 58 ff. below.

wages and conditions in the undertaking or industry. A sense of grievance is readily translated into a set of restrictive attitudes.

(4) The nature and size of the union, and in particular whether it is a craft union or an industrial union. A small local union defending a small section of craftsmen has a tendency to be more restrictive in outlook and practice than a big national mixed union. In the United States—

Industrial trade unions have accepted the principle of the inevitability of industrial change. They came into being with a distinct sympathy for change. Even during the thirties, in the midst of widespread unemployment, leaders voiced their conviction that industrial progress was inevitable and could bring general benefits if workers are protected from having to carry the brunt of the costs of change and could share in the benefits.¹

(5) Relations with other unions. Some restrictive practices, especially in regard to demarcation lines and upgrading, are directed not against employers but against other unions.

(6) The situation of the labour market. Memories and fears of unemployment are probably the most prolific of all sources of restrictive practices. Trade unions realise very clearly that technological progress and higher productivity may entail costs as well as gains. These costs include: (a) the erosion of individual skills and experience; (b) the need for some workers to change their jobs and perhaps their places of residence; and (c) the fact that some individuals may never be able to make the changes required.

More and more, however, trade unions are realising that it is not technological progress as such which is the enemy but rather the danger of an unfair distribution of the gains and costs of technological progress. More and more, instead of allowing fear of the costs of technological progress to serve as a pretext for opposition to changes that raise productivity, they are accepting the need for higher productivity, welcoming the opportunities it holds out for improved living standards, and addressing themselves to the task of negotiating with employers reasonable safeguards for the interests of workers.² A document on "Prices, Wages and Productivity" adopted by the General Council of the International

² While these statements appear to be true of the majority of trade unions, it must be remembered that the Communist trade unions, which are powerful in certain Western European countries, are, in principle, opposed to co-operation with employers for the purpose of increasing productivity in non-Com-

[Footnote continued overleaf.]
CONFEDERATION OF FREE TRADE UNIONS IN JULY 1952 CONTAINS THE FOLLOWING PARAGRAPH:

In view of the favourable conditions which rising productivity creates for improvements in living standards, trade unions will usually agree to or even foster the introduction of better methods, provided that the wage and employment interests of the workers are adequately protected. If they can be assured that the workers will share in benefits of higher productivity, trade unions will be prepared to co-operate in finding scope for improvements and to take part in joint consultation with a view to the introduction of improvements in technique and organisation. Intimate knowledge of production processes, gained in practical everyday experience of the workers, may often be a source of valuable suggestions for gains in productivity. This source may be made available through joint production committees and similar bodies, but only in an atmosphere of good industrial relations.

As has been said in Chapter I, if workers are to co-operate in a drive to raise productivity and to abandon any restrictive practices they may have regarded as safeguards in the past, they will want, first, explanations, consultation and an opportunity for some degree of participation in the application of measures designed to raise productivity; secondly, a reasonable share in the benefits resulting from higher productivity; thirdly, safeguards to protect, so far as possible, their economic security; and, fourthly, safeguards in connection with workloads and work methods.

In so far as these are matters for action within individual establishments, they will be discussed in later parts of this report. In respect of each of these matters, however, there are general considerations that need to be borne in mind, and steps that may be taken at higher levels, too, and these will be discussed in the remaining parts of this chapter.

MUNSTER COUNTRIES. Certain non-Communist trade unions, too, believing that workers have thus far received little or nothing in return for their co-operation, have in recent months taken up a position notably less favourable to joint efforts to raise productivity. For example, the Third Congress of the French Confédération Générale du Travail—Force Ouvrière, held in Paris in November 1952, decided to withdraw its representatives from the Trade Union Productivity Study and Research Centre (see p. 138 below), and from all other bodies outside the Confederation that failed to give certain guarantees. This action did not, however, reflect opposition in principle to joint efforts to promote higher productivity. A resolution adopted by the conference declared that increased productivity, a decisive factor in which was the improvement of wages and hours and conditions of work, should benefit both workers and consumers; schemes for enabling employees to share in the benefits of increased productivity should be agreed upon by employers' and workers' organisations; and in each undertaking the conditions for the award of productivity bonuses should form the subject of a special clause, to be included in the collective agreement applicable in that undertaking in a manner to be decided on by the employers' and workers' organisations concerned. (Industry and Labour, Vol. IX, No. 3, 1 Feb. 1953, p. 110.)
INDUSTRIAL RELATIONS AND CO-OPERATION FOR HIGHER PRODUCTIVITY

It is within individual undertakings that there is normally the greatest scope for joint consultation and effective co-operation on matters connected with productivity. But where it is possible and appropriate to do so there are advantages in discussing at the level of the industry, or sometimes at regional levels, such matters as arrangements for sharing the benefits of higher productivity and the safeguards to be applied for the well-being of workers and the continuing efficiency of the undertakings in the industry, since such discussions may make possible some degree of uniformity in the application throughout an industry of measures designed to raise productivity.

Consultation at the level of the industry, and even at the national level, is especially important in connection with the problems of establishing new industries and planning and carrying out the modernisation or re-equipment of those in existence, since the employment opportunities and job security of workers in particular undertakings and places may in such cases depend largely upon decisions taken in the course of planning at higher levels. It is also important that representatives of employers and workers should be consulted by governments on questions of national policy affecting productivity.

National productivity centres, with expert staffs under the control of boards of directors or committees on which employers and workers as well as governments are represented, are playing an increasingly important part in programmes to raise productivity. Such centres have been established in a large number of European countries and elsewhere. Some of them operate as part of the normal administration of government; more usually, however, they function as independent or semi-independent bodies free from many of the restraints usually imposed upon government agencies. Their secretariats consist of carefully selected experts in the different fields of industrial and labour practice. Staffs range in size from less than ten to more than 60, excluding members of advisory committees. It has been suggested that efforts should be made to establish productivity and development centres in as many underdeveloped countries as possible.¹

¹ United Nations: Methods to Increase World Productivity. Working Paper by the Secretary-General, roneoed document E/2265, 24 June 1952; (Footnote continued overleaf.)
Governments have also taken a responsibility for encouraging the growth of labour-management co-operation within individual undertakings. In some 20 countries legislation now prescribes the establishment of works committees or similar machinery for labour-management co-operation in all industrial undertakings employing more than a certain number of workers.\(^1\) Opinions differ regarding the wisdom of attempts to impose by legislation the outward forms of co-operation in cases where the essential spirit of co-operation may be lacking.\(^2\) Whatever the merits of compulsory legislation on the subject, however, there is general agreement that the advice and assistance of government officials versed in the techniques of such co-operation can be of great value to undertakings desiring to establish machinery for joint consultation and co-operation, but lacking experience in this field.

The Distribution of the Benefits of Higher Productivity\(^3\)

The attitude of workers towards higher productivity, like that of everybody else, depends greatly upon what they expect to get out of it. Everybody agrees that workers as a whole should share in the benefits of higher productivity, and it is evident, at least in the more highly developed countries, that they have in fact done so. How large this share should be and what form it should take are, however, controversial questions.

What constitutes an equitable share for workers in the benefits of higher productivity depends upon particular circumstances. Canons of equity are subjective and there is little that can usefully be said on the subject in general terms. Most people would, however, probably agree with the following propositions:

(a) Workers should in general be compensated for any additional efforts or sacrifices (greater speed of work or night

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\(^2\) Cf. pp. 101 ff. below.

shifts, for example) which they may make to achieve higher productivity.

(b) It is not, however, primarily by calling upon workers to make greater efforts that productivity can be increased, and provided that workers are compensated for any increased efforts or sacrifices which may sometimes be required, they appear to have, over and above this, no claim in equity to receive a larger share of the benefits of higher productivity than other people in the same income group.

(c) As national incomes increase through higher productivity, there is a strong case in equity for an increase in the proportion of total income as well as in the absolute amount of income which goes to the less prosperous sections of the community, whether they be workers, small-scale independent producers, salary earners or pensioners.

Apart from considerations of equity, there are considerations regarding the efficiency and stability of the economic system that must also be taken into account. In the interests of efficient production it is important, for workers no less than for other sections of the community, that the returns on capital invested should be sufficient to induce an adequate rate of capital formation. This is especially important for workers in countries—including underdeveloped countries—where a shortage of capital restricts opportunities for employment.

As regards the stability of the economic system, it should be recognised that in the ordinary way the increment of income resulting from higher productivity in any one year is likely to represent only a small proportion of the total income available for distribution in that year. The stability of the economic system as a whole is therefore not likely to be greatly affected by the way in which this increment of income is distributed, except in cases where increases in productivity are rapid and sustained. It may however be pointed out that those with smaller incomes than the average, having more unfulfilled desires and needs, tend to spend a larger-than-average proportion of their incomes, i.e., have a relatively high propensity to consume. Since most workers fall into this category, the distribution to workers of a large share of the benefits of higher productivity will be a factor making for a high rate of spending on consumers' goods and services in the economy as a whole. At a time when aggregate demand needs stimulating in order to provide an outlet for all the goods and
services produced this is likely to have a healthy effect on the stability of the economic system. When, however, there is already too much money chasing too few goods it is liable to give rise to unhealthy inflationary pressure. Even if there is no threat of inflation, the state of the economy may seem to require an expansion of investment rather than of consumption.

If it is felt that equity requires that workers should receive a larger share of the benefits of higher productivity than can immediately be distributed to them without unduly curtailing investment or without giving rise to unhealthy inflationary pressure, consideration may be given to the possibility of granting them benefits that do not make an immediate demand upon resources—"forced savings" or titles to newly created capital assets.¹

No less controversial than the question of the size of the workers' share in the benefits of higher productivity is the question of the form which this share should take. This is not only a question of the choice between higher money wages on the one hand and lower prices for consumers' goods on the other. A part of the increased wealth yielded by higher productivity may, in many cases, reasonably take the form of social services and better working conditions; or, where appropriate, of a reduction in normal hours of work. It is well known that in the more highly developed countries working hours have tended to become shorter as productivity has increased.

Special interest attaches to the question of how far the share of workers in the benefits of higher productivity should take the form of higher money wages and how far of lower prices for consumers' goods.

The claims of the so-called "fixed income" groups to share in the benefits of higher productivity constitute a strong argument for allowing productivity gains to be distributed at least partly in the form of lower prices, unless special efforts are made to ensure that salaries and pensions, at least in the lower ranges, rise at about the same rate as money wages. This argument, based on considerations of equity, is supported by another invoking economic efficiency. It is argued that, if higher productivity is translated into lower costs and lower prices, the competitive position of the undertaking, the industry or the country concerned will be strengthened. This will be particularly important in any

country whose balance-of-payments position is such that it needs to export more in order to meet its import bill.

While the force of these arguments in certain circumstances cannot be denied, other arguments can be used to support the view that in a free enterprise economy, in normal circumstances, stable prices and rising money wages are preferable to falling prices and stable money wages.\(^1\) Among the arguments in support of this point of view are the following:

(1) Falling prices increase the burden of debt, i.e., increase the amount of real wealth transferred with every pound or franc paid as interest to bond-holders. This is an important consideration both for governments and for business.

(2) If higher productivity is reflected chiefly in falling prices and if, as is to be expected, productivity increases faster in some countries than in others, price levels in the different countries will tend to get out of alignment, and the countries in which productivity increases least will tend to find their currencies overvalued. Policies aiming at approximate stability of national price levels, different rates of increase in productivity being reflected in different rates of increase in money earnings, may make it easier to maintain a state of balance in international payments.\(^2\)

(3) At any one time some industries are expanding and need more labour, while others are contracting and need less labour. Wage disparities between industries may play an important part in attracting labour to the industries where it can be used to the greatest advantage, since expanding industries commonly offer higher wages than contracting industries. Average money wages in the economy as a whole can be kept stable only if wage increases in some industries are balanced by wage reductions in others.

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\(^2\) This does not mean that an appropriate wage policy would obviate or remedy all balance-of-payments difficulties, for some such difficulties are "real" and not "monetary", i.e., are liable to arise whatever adjustments may be made in money incomes and wages. A number of writers regard the disparity between the rate of increase in productivity achieved in North America and that which has been achieved by most other countries as the fundamental cause of the long-term dollar shortage, which in their view is not adequately explained by the sequence of more or less transitory phenomena with which it has been entangled—war debts in the 1920s, world depression and the flight of capital before Hitler in the 1930s, war damage, more war debts and the cold war in the 1940s and 1950s. For a recent and illuminating analysis of this problem see J. R. Hicks: "An Inaugural Lecture" in *Oxford Economic Papers* (Oxford, Clarendon Press), Vol. 5, No. 2, June 1953, pp. 121 ff.
But to reduce wages, even if prices are falling, is notoriously difficult, and is likely to give rise to serious friction, with harmful effects on the productivity of the workers concerned. If, on the other hand, the aim of policy is stable prices and rising money wages, the necessary wage differentials can be created mainly by raising wages more in some industries than in others, and an important source of friction may be eliminated.

(4) Unless workers receive some increases in money wages from time to time it will be difficult to convince them that they are in fact sharing in the benefits of higher productivity. Cost-of-living index numbers do not always inspire confidence, and an increase in real income is much more tangible if it takes the form of an increase in money earnings. Moreover, trade union leaders, if they are to retain the confidence of their members, must have something to deliver. They get the credit for increases in money wages but not for reductions in the cost of living. Nor is this all: if money earnings are kept stable no individual employer, and no group of employers in a single industry, can guarantee that workers will experience a fall in the cost of living. The most an individual employer can guarantee is that he will reduce the prices of his own products. This will be of negligible advantage to his workers unless other employers do likewise, and workers can have little knowledge or assurance regarding the intentions of other employers. It follows that, even if workers as a whole would in fact be equally well off under a policy of stable money wages, each individual group of workers will feel much more confident of receiving an adequate share of the benefits of higher productivity, and will probably feel more disposed to co-operate in efforts to raise productivity, if the policy is one of raising money wages as productivity increases.

(5) The above arguments against a policy of falling prices and stable money wages assume that, if money wages are kept stable, prices will in fact fall. One of the principal arguments in favour of a policy of encouraging money wages to rise in step with productivity is, however, that, even if money wages do not rise, prices may not fall, or may not fall sufficiently to give workers a fair share of the fruits of higher productivity. Competition often seems inadequate to bring about prompt (or even in some cases gradual) reductions in prices when costs of production fall. Trade unions, on the other hand, constitute powerful instruments for raising, in the first place, the money wages of their own
members and, through this, the general level of wages and salaries. Since consumers are largely unorganised while workers are organised, it is safer, it is argued, to rely on rising wages than on falling prices to increase the real purchasing power of consumers and to secure a wide distribution of the benefits of higher productivity. To represent the problem as a choice between lower prices or higher wages does not, according to this way of thinking, pose the question squarely.

In circumstances in which it is considered desirable that money wages should rise more or less in step with increases in productivity, it would seem, however, that wage increases should be related rather to the rate of growth of labour productivity in the economy as a whole than to the rate of growth of labour productivity in particular industries. The reason for this is that the scope for increased productivity is vastly greater in some branches of production than in others, and the extent to which productivity increases in different industries over a period of time often bears little or no relation to the relative efforts and sacrifices made by workers in them. For example, in the United Kingdom between mid-1948 and mid-1950, while labour productivity in industry as a whole appears to have increased at the rate of about 6 per cent. per annum, productivity in the production of vehicles appears to have increased at the rate of nearly 20 per cent. per annum. While the efforts of workers in the industry certainly contributed to this result, the explanation lies chiefly in continuous output and a smooth flow of materials and components. During this period the industry experienced the fruition of its post-war reconversion and was confronted with little need to introduce major changes of design. In Japan between 1950 and 1951 labour productivity is estimated to have increased by 22 per cent. in the iron and steel industry, but to have fallen by 5 per cent. in the production of cotton yarn. In the United States between 1939 and 1947 output per man-hour in the rayon industry rose by about 100 per cent. while in the anthracite coal industry it fell by about 10 per cent. If wages in each separate industry were to increase in proportion to increases in productivity in that industry, relative wages in different industries would soon get badly out of alignment and the results would be highly inequitable.

1 This is not to say that wages in some industries and occupations should not rise rather faster than the average while others rise rather more slowly, provided that such divergences represent movements towards and not away from a balanced wage structure for the economy as a whole.
These arguments, though they may help to set the problems in perspective, do not answer the question: What is labour's "reasonable share" of the benefits of higher productivity in any particular case? Nor do they settle the question of the form which this share should take. These are clearly questions to which there are no simple universal answers. Each case must be decided on its merits, with due regard to general considerations of the kinds discussed above.

The problem of ensuring that workers receive a just share of the benefits of higher productivity (whether this share takes the form of higher wages or lower prices) presents certain special features in underdeveloped countries. It is in these countries, where widespread poverty, ignorance, disease and malnutrition impair the capacity of workers, that it is most important to bring about an improvement in workers' living standards, principally as an end in itself but also as a means towards building up a stable and productive labour force. But it is precisely in these countries, where labour is usually abundant while capital is scarce and dear, and where trade union movements are in the early stages of development, that improvements in workers' standards of living are least likely to come about spontaneously through competition or by collective bargaining. In such conditions it seems likely that, in the absence of special action, the benefits of higher productivity may not be fully shared by workers.

It would seem, therefore, that in such circumstances governments have special responsibilities (a) to take such steps as may seem appropriate, through minimum wage legislation, price control measures, etc., to ensure that workers receive a fair share of the benefits of higher productivity; and (b) to do all they can, including the enactment of appropriate legislation, to create conditions favourable to the growth and strengthening of responsible trade union movements. In this task the governments of underdeveloped countries are handicapped by a number of factors, including notably their inability to afford the expense of adequate administrative machinery, and in some cases a shortage of trained personnel with the administrative experience to enforce legislation and regulations. It is a characteristic of many underdeveloped countries that the intentions of the government outstrip the means at its disposal for giving effect to them. Advanced labour legislation which is not effectively enforced represents a hollow victory for labour and may do more harm than good by giving rise to false hopes and subsequent disillusionment and discontent. The impor-
tance of vigorous measures to enforce legislation and regulations once adopted cannot be over-emphasised. Technical assistance can play a valuable part in the training of administrative personnel and the development of efficient inspection services. The creation of conditions favourable to the development of trade unionism is important not only in itself but as an adjunct to the work of inspection and enforcement. A trade union provides an indispensable channel through which the grievances of workers can be brought to the notice of those responsible for remedying them. The importance of workers’ education, as a means of enlarging their understanding of social problems and strengthening trade union action, cannot be exaggerated.

In many underdeveloped countries governments are themselves the principal large-scale employers. In others the principal large-scale employers are private companies which stand in a special relationship to governments—for example, oil companies which have negotiated concessions with governments. These facts provide opportunities for setting and enforcing in the establishments concerned labour standards that may be difficult as yet to enforce throughout the economy.¹ When the government is itself the employer, or when government agencies are associated with private employers, difficulties of inspection and enforcement are usually much reduced, and it is important that wages and conditions of employment in large-scale enterprises owned or directed by governments or standing in a special relationship to them should be such as to serve as a lever for raising labour standards throughout the economy. This they may do both through the forces of competition and by serving as examples to other employers.

**Productivity and Economic Security**

It is of the utmost importance, in order both to ensure that increases in productivity do in fact lead quickly to greater economic and social welfare and to enlist the support of workers for productivity programmes, that everything possible should be done to combat the unemployment which may in certain cases result from increases in productivity. It is inevitable that workers who grew up, or who spent long years of their lives, under the shadow of the great depression should retain a very real fear of unemploy-

ment and should look askance at anything that appears to threaten the security of their jobs.

Unemployment is a complex phenomenon having various causes. It can be classified in various ways. Distinctions are often drawn, for example, between cyclical, seasonal, casual and technological or structural unemployment. There is no reason to suppose that measures to promote higher productivity tend in themselves to increase cyclical or general unemployment attributable to a periodical or chronic deficiency of aggregate demand. Since the war there has been relatively little unemployment of this kind, and most people would agree that this type of unemployment, should it again threaten to become important, would not be a result of measures taken to raise productivity but of other factors making for depression, which would be as hard or harder to combat in an economy with low productivity than in an economy with high productivity. Nor is there any reason for supposing that higher productivity tends in general to increase seasonal or casual unemployment.

But, if it is a fallacy to suppose that higher productivity always tends to make for unemployment, it cannot be denied that technological progress does change the nature of employment opportunities and does from time to time make particular groups of workers redundant in particular occupations and places. Efforts to speed up the rate of technological progress may tend to increase the incidence of technological unemployment of this kind.

It is necessary, however, to distinguish between the effects of technological improvements on employment in the industry in which they occur and their effects on employment in general.

Technological changes in an industry may have three possible adverse effects on employment in that industry: (a) there may be a decrease in the amount of employment available in the industry as a whole; (b) there may be a decrease in the amount of employment available in particular places; (c) there may be a decrease in the employment opportunities open to particular categories of workers in the industry. The mere fact that a decrease in employment opportunities for particular workers or in particular places may be compensated, as far as the industry as a whole is concerned, by an increase in employment opportunities elsewhere, or for other categories of workers, will not obviate hardship in particular cases unless special measures are taken with this end in view.

To distinguish these three sources of possible hardship to workers is not, of course, to say that it should be the policy of an industry
in all circumstances to prevent any decrease in employment either in the industry as a whole or in particular places or for particular categories of workers. Such changes may at times be necessary incidents in the progress of an industry and the development of a country's economy. To try to prevent such changes from ever occurring would be to try to arrest the economic development of the country at whatever stage it happened to have reached, which would be fatal alike to economic progress and to social welfare. What is important is to ensure that, when technological changes do lead to a narrowing of employment opportunities under any of these three heads, steps should be taken to keep to a minimum any hardship that may be entailed.

Any labour-saving technological change is liable to involve a decrease in the amount of employment offered in the industry in which it occurs, unless the demand for the product increases sufficiently to provide alternative employment for workers whose services would otherwise be dispensed with. There are, however, certain reasons why demand may increase sufficiently to prevent a drop in the numbers employed in the industry.

Take, for example, the case of a labour-saving technological change in the steel industry. In the first place the demand for steel may increase quite independently of this particular change. This is likely to be the case, in the short run, during the upward phase of a trade cycle, and technological changes introduced at such a time are likely for this reason to cause less hardship than they would if introduced during a depression. In the longer run, too, the demand for steel is likely to increase, taking an average of good years and bad, if the economy as a whole is expanding, i.e., if population and income are increasing.

Secondly, the demand for steel may expand as a direct result of a technological improvement, if that improvement makes it possible to sell steel more cheaply and thus to tap new sources of demand. Employment opportunities depend, though to a greater extent in some industries than in others, on the price policy of the industry. Even in the case of an industry such as the steel industry, the demand for whose products has not shown itself particularly elastic to price changes and has been much more influenced by the current phase (prosperity or depression) of the trade cycle, it can scarcely be doubted that, other things being

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1 No particular significance attaches to this choice of example. For "steel", wherever it occurs in the course of the argument, one may read "the product of the industry in which the technological improvement occurs".
equal, more will be sold over a period of years at low prices than would be sold at higher prices. An industry in any one country, moreover, is commonly exposed, in export markets at least, to competition from other countries; and unemployment may result if its prices are not competitive.

Even if, however, demand does not increase sufficiently to prevent some fall in the number of man-hours of work available in the steel industry, it does not follow that there need be unemployment. In the first place it may be possible to maintain the level of employment by working shorter hours. Irregular short-time working is, of course, unsatisfactory both for employers and still more for workers. But a reduction in the length of the normal working week may in certain circumstances be a reasonable and satisfactory way of absorbing the effects on employment of technological progress. It was largely in this way that the effects of the very remarkable technological progress in the United States iron and steel industry between 1929 and 1939 (notably the introduction of a considerable number of continuous strip mills dispensing with a very large amount of labour) were absorbed. The case for a reduction in normal hours of work has, however, to take account of effects on costs of production and on the competitive position of the industry concerned. A lengthening of paid holidays may have an effect similar to that of a reduction in normal working hours in spreading a given amount of work over a larger number of workers.

Secondly, even if there is a fall in the number of workers employed in the steel industry, there still need not be unemployment in the industry provided that the drop in employment is not larger than can be absorbed in the ordinary labour turnover. The substantial number of vacancies arising each year in all branches of industry through deaths, retirements and voluntary departures greatly eases the problem of finding jobs for workers displaced by technological improvements.

We have thus far considered only the effects of technological progress on employment in the industry in which the progress occurs. Even if, in our example, there is some reduction in employment in the steel industry, there still need not be any increase in unemployment in general if employment in other industries expands sufficiently. This again may happen, for reasons quite independent of technological improvements in the steel industry, if the general state of trade is improving or the economy as a whole is expanding. But it may also happen as a direct consequence of
the technological improvement in the steel industry, if this enables steel to be sold more cheaply. Since the number of jobs available in any industry depends partly upon the prices and availability of the materials and equipment required to set labour to work, a cheapening of steel is especially likely to stimulate employment in the steel-using industries. More generally one may say that—particularly perhaps in underdeveloped countries where unemployment and underemployment of labour can be attributed largely to the lack, or to the high prices, of co-operant factors of production—higher productivity in industries producing certain types of capital goods should help to expand employment opportunities. But increased employment may not be confined to the steel-using industries. If consumers are now able to satisfy their requirements for steel more cheaply than before, they will have more to spend on other things, and the effects on employment of the cheapening of steel may be diffused widely throughout the economy.

In examining the effects on employment of a technological improvement it is, then, a mistake to confine attention to the particular industry in which the improvement occurs. All this, however, does not mean that there may not be very serious problems of adapting the supply of labour to changes in the demand for labour resulting from technological improvements. The existence of new employment opportunities elsewhere is of little help to workers displaced from particular jobs if they cannot move or if they lack the training and qualifications required for the new jobs. Technological progress, especially if it occurs rapidly, may lead to serious structural maladjustments in the labour market.

The problem of the effects of higher productivity on job security is especially difficult in countries with a large amount of unemployment and underemployment—and this includes many of the underdeveloped countries.

Where there is a surplus of labour, displaced workers are more difficult to absorb, and it might seem that policy in such countries should aim rather at increasing production and employment than at higher productivity. Certainly, measures taken in such countries to promote higher productivity should form part of a coordinated economic development programme designed to expand opportunities for employment as well as to raise output. Certainly, too, it would be inappropriate to attempt to adopt, in countries where labour is abundant and cheap and capital scarce and dear, the capital-intensive and labour-saving methods of pro-
duction which are appropriate in such countries as the United States and Canada.

. . . Labour-saving technology is not of great value to an economy which is overpopulated. There the search should be rather for technologies which increase the yield of land per acre, or which enable large numbers of persons to be employed in secondary industries for a small expenditure of capital.¹

Surveys of the ratio of capital to labour employed in existing industries may help to identify the industries in which additional investment may be expected to create the greatest employment opportunities, provided that there is a sufficiently large market, per unit of capital invested.²

Most of the countries with widespread unemployment or underemployment are, however, faced with the need for reducing costs of production and improving products so as to expand domestic and foreign markets and thus achieve higher incomes and more opportunities for employment; and all of them stand to gain by making the most effective use of existing equipment and of all the workers for whom it can provide employment. Higher productivity must, therefore, go hand-in-hand with measures to expand employment opportunities.

In the Director-General's Report to the 33rd Session of the International Labour Conference the question was asked: "How far is security compatible with maximum productivity?" and the following answer was suggested:

If "security" is interpreted to mean security that no worker will ever lose his present job, the two things are quite evidently incompatible. A highly productive economy is an economy which responds rapidly and efficiently to changes in needs and in the conditions of supply and production; in which resources move out of industries and occupations where they are less productive into others where they are more productive; in which improved techniques of production and management are grasped and applied as soon as they become known and available. In short, a highly productive economy is essentially a dynamic economy; an economy offering security of continued employment for all workers in their present jobs would be static in the last degree. If, however, "security" is interpreted to mean confidence that society will continue to need, and to pay for, the services of all who can contribute to the work

of production, and will take pains to make sure that those who can no longer be employed in their present jobs will be fitted to contribute in other ways, then high productivity and security are not merely not incompatible; security in this sense is a necessary condition for maximum productivity.¹

Security in this sense requires three things, namely—

(a) Effective measures to maintain a high general level of employment; there is widespread agreement that this is primarily a responsibility of governments.

(b) Measures to keep to a minimum the number of workers who may lose their jobs and to assist the re-employment of displaced workers; this is in large degree a matter for managements in consultation with workers' representatives, but governments also have a part to play.

(c) Measures to protect the living standards of workers who may lose their jobs; this is primarily a matter for governments, but individual undertakings, or an industry as a whole, may be able to contribute to maintaining the living standards of unemployed workers by granting severance pay or in other ways.

Measures to Maintain a High General Level of Employment

This is not the place to discuss the content of a "full employment" policy nor the difficulties to which it gives rise. These matters have been discussed in numerous I.L.O. reports ² as well as in other literature. It will suffice here to emphasise, first, that a policy aimed at maintaining a high general level of employment is not sufficient to ensure that there will be no unemployment in particular industries, arising out of increased productivity or shifts in the direction of demand, which can occur even with a high general level of activity. Such a policy aims at ensuring that there shall be, in the aggregate, enough jobs; it cannot ensure that new jobs shall be available in precisely the occupations and places where workers may lose their present jobs. Secondly, however, effective measures to prevent general unemployment will enormously ease the problem of re-absorbing into productive employment any workers who may lose their jobs in particular

² The latest I.L.O. report which deals with these problems in general terms is Action Against Unemployment, Studies and Reports, New Series, No. 20 (Geneva, 1950).
industries. As long as there are enough jobs, and provided that suitable training, retraining and transfer facilities are available, there is no reason why an unemployed worker who is willing to undergo training, and if necessary to change his place of residence, should remain unemployed for long.

Measures to Reduce the Displacement of Labour and Assist the Re-employment of Displaced Workers

Measures which can be taken by individual managements to this end are of the utmost importance, and will be discussed later.\(^1\) Action at a higher level is, however, also important, and may take various forms.

Selection of the Industries in Which Productivity Increases Are to Be Encouraged.

The number of workers for whom new jobs must be available if unemployment is to be avoided will depend partly upon the circumstances confronting the particular industries in which technological improvements occur. In so far as governments, through national development programmes, capital allocations, allocation of raw material supplies or in other ways, influence the relative rates of growth of productivity in different industries, it seems desirable that, without neglecting the need for structural changes which may sometimes be unavoidable, they should use this influence to ensure that priority is given to the task of raising productivity in industries where higher productivity is not expected to lead to a displacement of labour. In selecting such industries attention should be given both to markets and to raw material supplies. At times when there is a shortage of materials increased productivity in the industries using the scarce materials is particularly likely to restrict employment opportunities. Higher productivity in the automobile industry, for example, at a time when additional supplies of steel are unobtainable, is likely to lead to unemployment in the automobile industry, whereas higher productivity in the steel industry might not only not lead to unemployment in that industry, but might stimulate employment in the steel-using industries.

In countries in which handicraft and cottage industries employ large numbers of persons an increase in productivity in modern

\(^1\) See pp. 110 ff. below.
industries which produce similar products may lead to considerable unemployment. This will obviously be an important consideration in the minds of those responsible for selecting industries to which priority is to be given in national programmes for economic development or drives for higher productivity. Ordinarily the industries where an increase in productivity promises the greatest benefits from the point of view of economic development as a whole will be industries where an increase in output or reduction in costs or both will provide the resources for expansion of output and employment in other industries.

**Vocational Training and Retraining Facilities.**

This subject is discussed elsewhere in this report. All that need be said here is that the occupational mobility of workers and their adaptability to changes in employment opportunities can be greatly increased by the provision of adequate training and retraining facilities, and that for the provision of such facilities governments as well as industry have a responsibility.

**Promotion of the Geographical Mobility of Labour.**

Workers may sometimes need to change not only their jobs but also their place of residence. Difficulties encountered in this connection include—

*(a)* the natural reluctance of many workers to uproot themselves and break social and family ties;

*(b)* ignorance of conditions and opportunities existing elsewhere;

*(c)* the financial cost of moving; and

*(d)* a shortage of housing.\(^1\)

Methods of meeting these difficulties include—

(1) The provision of as much information as possible to displaced workers regarding both opportunities for employment and living conditions elsewhere; the importance of the development of

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\(^1\) To the physical shortage of housing there is added in a number of countries at the present time another obstacle to movement arising out of rent control measures. It is often the case that the occupant of a pre-war house or apartment pays only a fraction of the rent demanded for new accommodation of the same standard. If a newcomer does find accommodation in a strange town, it is much more likely to be new and dear than old and cheap, and the cost of moving is therefore often higher than it would be if rents were more uniform.
nation-wide employment services needs to be stressed in this connection.

(2) The payment by governments of removal grants to workers moving to take up employment elsewhere.

(3) Vigorous action to overcome housing shortages; in some countries a rationalisation of rent control measures might also help.

It may in certain cases be appropriate to organise the international migration of workers, if possible accompanied by their families. All the difficulties encountered in promoting the geographical mobility of labour within a country are in these cases likely to be encountered in an enhanced degree, but the problems to which migration gives rise cannot be discussed in this report.

Measures to Encourage the Development of Alternative Employment.

This point has to some extent been covered in general terms by what has been said about the importance of maintaining full employment. If an industry or group of industries in which technological unemployment exists or threatens to appear is highly localised, there may, however, be a case for special measures to attract new industries to the workers, instead of relying entirely on the workers' moving to industries elsewhere. In the United Kingdom, for example, certain areas have been selected as development areas and special facilities are granted to employers establishing factories in these areas.

Measures to Protect the Standards of Living of Unemployed Workers

The greater the success of measures to maintain a high general level of employment, and to reduce the numbers and to promote the re-employment of displaced workers, the less it will be necessary to fall back upon measures to protect the standards of living of workers unemployed between jobs. Such measures are, however, an essential counterpart to the measures thus far considered if productivity is to be increased with a minimum of hardship.

Unemployment Insurance and Relief.

A comprehensive scheme of unemployment insurance or unemployment assistance can play an important part in alleviating hardship. The cash benefits available as a right under an unem-
Employment insurance scheme provide unemployed workers with a partial income to tide them over between jobs, and thus help to smooth the necessary adjustment of the labour force to the changing demand for labour. Because of the limited financial resources at its disposal, unemployment insurance must concern itself principally with temporary or short-term unemployment rather than large-scale mass unemployment. While designed to apply to all types of unemployment, irrespective of cause, this branch of social insurance can be especially effective in combating the effects of technological unemployment.

The administration of unemployment insurance should be, and usually is, linked very closely with the employment service mechanism. Employment exchanges generally serve as the local agencies of the unemployment insurance scheme. This ensures that, before benefit is granted, claimants are given such opportunities for suitable work as may exist.

Where there is no national system of unemployment insurance, or to supplement such a system and to deal with cases which cannot easily be brought within its framework, a national system of unemployment assistance or relief is also of the utmost importance.

While unemployment relief, like unemployment insurance, is primarily a matter for governments, an industry experiencing rapid technological progress involving considerable displacement of labour may in certain cases contribute to funds to be used in the mitigation of hardship in particular cases.

**Severance Pay.**

Provision may be made for the payment of dismissal wages or severance allowances to displaced workers. Normally this will be a matter for collective bargaining, either on an industry-wide basis or with individual employers; and the amount of the severance allowance, if any, is usually related to length of service. Provision for severance pay appears to be more common in the United States than elsewhere, but it is by no means unusual in other countries. In the United Kingdom, for example, the National Coal Board supplements for six months the unemployment pay of men made redundant by colliery reorganisation. The General Rules for the Modernisation of the Textile Industry in Mexico, which came into effect in February 1951, provide for a graded scale of compensation to dismissed workers. Severance pay has much to recommend it, though it would be bad for the flexibility and productivity of an
higher productivity in manufacturing industries

Consultation between governments, employers and workers, a fair distribution of the benefits of higher productivity, and effective action against unemployment will provide most of the conditions needed for ensuring that higher productivity does in fact lead to greater economic and social welfare, and will go far towards creating a psychological climate favourable to higher productivity. Such a climate will not prevail, however, if higher productivity is sought, or if workers have reason to fear that it may be sought, by methods which reduce the satisfaction they derive from their jobs—in particular by methods which require of workers greater speed or intensity of work than they can perform without strain, danger to health, or undue fatigue, or which simplify and break down jobs which formerly called for skill and responsibility into a series of simple routine operations which have no interest or meaning for workers.

To safeguard the interests of workers on these points is essentially a matter for labour-management co-operation within individual undertakings; but these are among the problems which, as suggested above, may sometimes be usefully discussed also at higher levels with a view to securing agreement upon general principles to be applied in individual undertakings.

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1 See p. 115 below.
2 See pp. 136 ff. below
CHAPTER III

ECONOMIC AND INSTITUTIONAL FACTORS AFFECTING PRODUCTIVITY

A list of economic and institutional factors affecting productivity could be spun out almost indefinitely. The present chapter aims to do no more than comment briefly on some of the more important of these factors.

THE SIZE OF MARKETS

The size of the market for a product influences in a variety of different ways the productivity of the resources engaged in making it. It affects, for example, the amount of capital equipment that can profitably be installed; the size of plants; the extent to which advantage can be taken of the possibilities of simplification, standardisation and specialisation; and the degree of utilisation of capacity.

It is true that a relatively small national market shared between a relatively small number of firms may in many ways afford about as much scope to the individual firm as a larger national market shared between a larger number of firms. There are, however, at least two ways in which it will not do so.

In the first place, when the national market is small, producers are likely to have less scope for specialising in the efficient production of a relatively few standard lines. In the second place they will themselves constitute a smaller market for the services of outside specialists or specialist firms. They are likely to have to do for themselves a number of things which, if they were producing for a larger market and were therefore part of a larger industry, could be more economically and efficiently done for them. As Mr. Graham Hutton has pointed out—

... the “buying-out” of components—and even of specialised services, like local transport, maintenance of machinery and plant (or parts thereof), and even of research and management-training—is quite usual in America, because the size and scope of industrial operations in that vast market make such independent specialised services
profitable. It is dubious if such ancillary trades could ever pay in Switzerland, Denmark, Sweden or Belgium.

In Western Europe the nearest approximation to the American ancillary trades, serving ordinary industries, is a multiplicity of special (and probably costly) departments owned and run by the larger enterprises themselves. Thus, there is to some extent both duplication and unnecessary maintenance of partly idle facilities in European countries.¹

In reports of the Anglo-American Council on Productivity and in other studies the large size of the American market is mentioned repeatedly among the factors which contribute to the high level of productivity in the United States. Few British foundries, for example, receive the large orders that enable United States foundries, serving a market ten times as big, to mechanise the production even of large castings. And it is probable that the small size of the home market, in the case, e.g., of the Benelux countries or of Austria, has made it more difficult for these countries to develop efficient heavy industries.²

Greater freedom of international trade enlarges national markets. The hope that advantages comparable to those enjoyed by producers in the United States may ultimately be obtained by European producers is one of the principal motives underlying the efforts that are being made to integrate more closely the economies of the Western European countries. In Eastern Europe, too, the Council of Mutual Aid is taking steps to dovetail the economic plans of the various countries.

It is true that a world afflicted by balance-of-payments difficulties and divided into hard and soft currency areas is a world in which it is particularly difficult to move towards greater freedom of trade. But the need for higher productivity makes it essential to scrutinise with the utmost care any movement in the direction of greater economic autarchy—any decision, that is to say, which reduces the scope for international specialisation and division of labour. The desirability of expanding and stabilising international trade, if full advantage is to be taken of opportunities to raise productivity, was one of the most constantly recurring themes in a debate on productivity which took place at the 36th Session of the International Labour Conference in 1953.

¹ *We Too Can Prosper*, op. cit., pp. 89 and 90.
² See, for example, statements by the Belgian foundries and forging and stamping productivity teams which visited the United States, in: *Bulletin hebdomadaire d'information et de liaison*, published by the Fédération des entreprises de l'industrie des fabrications métalliques (FABRIMÉTAL), No. 250, 9 Apr. 1951, p. 271, and No. 255, 14 May 1951, p. 389.
ECONOMIC AND INSTITUTIONAL FACTORS

THE LEVEL OF ECONOMIC ACTIVITY

Productivity is affected not only by the size but by the stability of markets. Except to the extent that production for stock is possible, a highly unstable market requires continual changes in the rate of production.

As compared with a period in which the level of activity is normal in the sense that resources are utilised about as fully as they can be without strain or dislocation, a period of depression is a period not only of low production but of low productivity of resources in general. This is because input cannot easily be reduced in proportion to output—at least in the short run. Much industrial equipment, designed to produce economically at a certain rate of output, cannot be operated efficiently if it has to be used at a rate substantially below capacity, such that overhead costs are not spread over a sufficiently large output. The steel industry affords a familiar illustration.

Even in a period such as the past eight years, characterised by a generally high level of demand, there have been many examples of the harmful effects on productivity of under-utilisation of capacity in various branches of industry. During the recession that occurred in a number of countries in 1949 and the early part of 1950 many industries, especially heavy industries, suffered from excess capacity. Many consumer-goods industries experienced a recession in demand and were unable to make full use of their capacity in 1951 and 1952. This was not only bad for productivity in itself but also dampened enthusiasm for measures to raise productivity, which are in general less likely to be welcomed at a time when it is difficult to dispose of existing output.

The harmful effects on productivity of a low level of activity, whether in the economy as a whole or in particular industries, are to some extent offset by the opportunities which exist for withdrawing resources from production, i.e., for reducing input along with output. Moreover, plant which is temporarily or permanently closed down is likely to consist mainly of relatively

1 Cf., for example, BRITISH PRODUCTIVITY COUNCIL: Review of Productivity in the Clothing Industry and Review of Productivity in the Hosiery Industry (London, 1953). The former report records that in the British clothing industry there had been a trend towards simplification of production during the years preceding the trade recession in the latter part of 1951; during the recession some of the ground previously gained was lost, though probably only temporarily. During this period orders had to be obtained wherever possible and the length of runs was unavoidably limited (p. 12).
old or inefficient plant, and workers who are laid off may include a high proportion of less efficient workers. (But, to the extent that resources withdrawn from production in one industry are not absorbed in other industries, the wastes of unemployment are, of course, substituted for the wastes of low productivity.) Another offsetting factor is that in depression profits are hard to come by and bankruptcies threaten; managements may be compelled to seek previously neglected opportunities for increasing efficiency.

As the level of activity rises towards normal and prosperity returns, wastes resulting from the under-utilisation of capacity are progressively eliminated, but the gain in productivity may be partly offset by the return to use of plant that is below average efficiency and perhaps by the engagement of workers of whom the same is true.

If the economy moves "from a state of normal prosperity into a period of forced draught"—as was the case in many countries during the two world wars—factors tending to reduce efficiency may come into the ascendant.

Equipment that is badly out of date is brought back into service. The labor force is augmented by unskilled schoolboys and housewives. Haste and confusion prevail in industry. Unsatisfactory materials and supplies have to be substituted for those usually employed. Shortages of metals prevent business from modernizing its plant and equipment at the usual rate. Sellers' markets prevail and inefficient producers in some measure are protected from the consequences of their inefficiency.¹

Anything that producers may be able to do to smooth out fluctuations in the demand for their products is likely to assist them to maintain a high level of productivity. In so far as such fluctuations are cyclical in character, however, the responsibility to maintain a high and stable level of income and employment rests primarily with governments.

In most countries governments now appropriate and spend a considerably larger proportion of the national income than they did before the war. Public authorities have become larger purchasers of the products of various sectors of the economy. As part of a more general policy designed to maintain full employment and full use of capacity it is therefore increasingly important that public authorities should avoid unnecessary irregularity in the timing and placing of their orders.

¹ Productivity—Gauge of Economic Performance, op. cit., p. 11.
THE MOBILITY OF RESOURCES

It is not sufficient to ensure that resources are utilised fully and in technically efficient ways; it is also necessary to ensure that they are utilised to produce the right things, i.e., in the industries and occupations where their productivity is greatest. Even if there is no technical improvement in any single industry, productivity in an economy as a whole may increase greatly if resources move out of industries and occupations in which they are less productive into others in which they are more productive.\(^1\)

The case for the greatest possible freedom of international trade rests upon this fact, for it enables countries to use their resources for producing the things they are best fitted to produce, and to import, in return for exports of these, the things they can least efficiently produce for themselves. It is generally agreed that there are advantages in greater international specialisation; but these advantages can be gained only if each country is willing to promote a movement of labour, management and materials out of the industries for which it is relatively ill-adapted and into the industries for which it is better suited. Such shifts, involving a loss of profits for some employers and a change of jobs for some workers, have painful consequences for individuals and special interests, and may meet with resistance. These consequences would seem to be a necessary price to be paid for the gains in productivity that greater freedom of international trade can bring.

Maximum productivity may also, as has been widely recognised, require considerable shifting of resources between different industries or services producing for home consumption. There may, for example, be too many workers in distributive trades or in entertainment industries and too few in coalmines or other basic industries. Here, too, necessary shifts may entail hardships for

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\(^1\) A distinction is sometimes drawn between a "technical" and an "economic" increase in productivity, the former meaning an increase in productivity resulting from a technically more efficient utilisation of resources, given the existing allocation of resources between industries and occupations, and the latter meaning an increase in average productivity in the economy as a whole resulting from a shift of resources to industries and occupations in which they are more productive—for example a shift of resources from agriculture to industry in an economy in which resources are more productive in industry than in agriculture. (Cf. Productivity—Gauge of Economic Performance, op. cit., p. 3.)
individuals and may meet with resistance. When, in the interests of productivity, a particular industry should contract, hardship can be reduced to a minimum only if the entry of displaced resources into other and more productive fields is made easy. The attitudes of employers and workers already established in these fields are of the greatest importance. Established firms in particular fields may seek by collusive action to exclude competition by newcomers. The entry of new workers may sometimes be resisted if trade unions take an unreasonable stand on matters affecting, for example, the duration of training or the definition and demarcation of jobs. It will be widely agreed that, in many countries at least, the war potential could not have been so fully mobilised and war production could not have expanded as it did if trade unions had not agreed to some relaxation of arrangements and provisions previously in force. The elasticity that was needed in order to win a war may be needed also in order to win the battle for higher productivity. Care may have to be taken to ensure that measures designed to enhance the security of workers are not applied in such a way that they impede the flow of labour into the most productive channels, for they may then defeat their own ends.

A British trade union team which visited the United States in 1949 placed considerable emphasis on the need to encourage labour mobility and flexibility in order to meet the demands on the British economy.\(^1\)

Apart from what employers and workers and their organisations may do, governments can also do a great deal to promote an economically desirable mobility\(^2\) of resources—for example by resisting pressure for the maintenance or imposition of restrictions on freedom of trade which are not in the best interests of the country as a whole, by improving national employment services, by pressing on with workers' housing projects, by improving training and retraining facilities for displaced workers or workers threatened with displacement, and by paying removal grants where appropriate.

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2. The statement that "mobility" of resources is desirable does not, of course, mean that resources should be in a state of perpetual motion between places or jobs but only that they should be free and able to move to places or jobs in which they would be more productive.

The relatively high degree of mobility of resources in the United States appears to be yet another of the many advantages it possesses in the matter of productivity.
Closely related, as has been seen, to the question of mobility of resources is that of the degree of freedom of competition which prevails. "Perfect competition", in the sense in which this term has come to be used by economists, does not exist and cannot be created in manufacturing industry. Because of the advantages and economies which accrue with experience to firms established in an industry, there is probably no such thing as real freedom of entry in an established industry where the scale of production is considerable. Many manufacturing industries tend to pass, as they grow, from the hands of the many into a situation in which they are dominated by a few large firms, even though a large number of small firms may retain a footing in them.

Competition between a few large firms, though it takes different forms and has different effects from the perfect competition of the textbooks, may be as vigorous as competition between many small firms. It is by no means clear that this form of competition, though it may be unfavourable to price reductions for existing models and varieties of products, is unfavourable to technical innovation. And technical innovation frequently results in improved models and new varieties of products, often at lower prices.

There is, however, a danger that cartel arrangements or other agreements for sharing a market between the firms in an industry may shelter inefficiency at the expense of consumers. Collusive price-fixing may have the same result. The policies of governments towards restrictive business practices are a matter of the greatest importance.

Efforts may be made to prevent the establishment of monopoly or monopolistic situations by rendering illegal the devices employed to drive competitors out of the market or to keep them out once a monopoly has been established; such devices are, however, often as difficult to identify as they are to control. Or the forms of monopolistic combinations, such as trusts and holding companies, may be made illegal; but legislation may be circumvented by the adoption of new forms of organisation which come within the letter of the law.¹

¹ "...In the struggle of wits between the company lawyer and the courts, the former is always one trick ahead, and has apparently always one more card to play when the present trick is trumped." (E. A. G. Robinson: *Monopoly* (London, Nisbet and Co., Ltd., 1941), p. 179.)
Measures aimed at preventing monopoly are inappropriate where economies of scale are so great that big firms drive little firms to the wall and competition itself ends in monopoly or a monopolistic situation. Possible methods of regulating (as opposed to preventing) monopolies include insistence upon greater publicity of the facts of monopolistic agreements, prices, costs and profits; the control of prices or profits; or the transfer of a monopoly from private to public ownership (though this is not in itself sufficient to ensure that it will be operated in the public interest).

The most obvious ways in which society can protect itself from monopolistic exploitation involve acting through the State. But associations other than the State, e.g., the consumers' co-operative movement and other large retail buying organisations, may have an important part to play. The consumer's ultimate weapon against monopoly is his power to take his custom elsewhere, and he need not always depend upon the State to create an "elsewhere" to take it to.

### The Quality and Availability of Materials

Productivity is greatly affected by the quality of materials. This was emphasised, for example, by the French electrical construction productivity team, which stated that the castings purchased by United States establishments in the electrical construction industry were much superior to those obtainable in France. Defects in French castings often appeared only in the course of fabrication, and French industrialists thus frequently found themselves obliged to reject work that had been almost completed. Such occurrences were unknown in the United States. French magnetic sheets were also stated to be of such inferior quality that they would probably be rejected in the United States. The difficulties experienced by French industrialists in regard to the quality of materials were attributed to the fact that in France the standards of quality required were more exacting for finished products than for raw materials; the reverse was said to be the case in the United States.

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1 Cf. John Kenneth Galbraith: American Capitalism: The Concept of Countervailing Power (Boston, Mass., Houghton Mifflin, 1952). Mr. Galbraith tends to attribute the fact that American capitalism has in recent years shown much greater stability than many people expected to the growth of power in the hands of consuming organisations, matching that of the large producing corporations.
States.\textsuperscript{1} The Confederation of Electrical Constructors (\textit{Syndicat général de la construction électrique}) has since taken steps to improve materials used in the electrical construction industry. The team from the French machine tools industry also commented on the excellent quality of United States materials. In the British clothing industry—

Cloth is still being received from the mills incorrectly shrunk; much time and cloth are wasted in almost every cutting room because of the numerous flaws in every piece of cloth . . . ; rolls of cloth received are still of various widths, and sometimes one roll of cloth varies by inches in width throughout the roll.\textsuperscript{2}

Apart from questions of quality there is also the question of the availability of materials. Shortages of materials, leading to interruptions in the flow of work or to recourse to less satisfactory substitutes, may, as post-war experience so clearly showed in many countries, have the most disastrous effects on productivity. A survey of productivity in France carried out by the Economic Co-operation Administration showed that shortages of materials and the erratic delivery of supplies in many of the establishments visited served in many ways to curtail plant efficiency. An inadequate and irregular flow of materials has been an important cause of low productivity in the Italian engineering industry since the war.\textsuperscript{3} Lack of materials was reported to be one of the factors accounting for a 15 per cent. drop in labour productivity in Danish shipyards in 1947-49 as compared with pre-war levels.\textsuperscript{4} Such shortages are often due to factors beyond the control of management, and it is recognised that the closest co-operation between governments and industry is necessary in order to minimise their harmful effects.

Another factor is the price of materials. High prices of materials necessitate the charging of high prices for products; and at such prices the lack of orders may prevent the application of continuous production methods or the full utilisation of capacity. Italian heavy industry, lacking domestic supplies of basic resources, charges prices ranging from 30 per cent. to 60 per cent. above world


\textsuperscript{2} \textit{Review of Productivity in the Clothing Industry}, op. cit., p. 13.

\textsuperscript{3} A. Jacoboni: \textit{L'Industria meccanica italiana} (Rome, Centro di Studi e Piani Tecnico-Economici, 1949), p. 98.

levels for the materials which it supplies to the Italian metal-using industries, a fact which impairs productivity in those industries.

**The Availability of Capital and Credit**

The terms on which long-term capital and shorter-term credits are available play a big part in determining the speed with which productivity can be increased by means of capital extensions, modernisation and re-equipment projects. To the extent that high rates of interest and onerous credit terms reflect real shortages of physical capital, the obstacles to progress arise out of basic economic rather than institutional factors. High rates of interest and onerous credit terms may, however, also be due in part to the underdeveloped condition of a country's money and capital markets, such that potential savings run to waste. In underdeveloped countries in particular both economic and institutional factors limiting the supply of capital are important in retarding progress. The more the capital-exporting countries, and institutions such as the International Bank for Reconstruction and Development, can do to make capital available in the underdeveloped countries, and the more the underdeveloped countries themselves can do both to make productive use of their own savings and to create conditions which will attract capital from abroad, the more rapidly their productivity may be expected to increase.

In the more highly developed countries, too, the state of the capital and money markets varies a great deal from one country to another. Mr. Maurice Olivier, president of the National Association of French Founders (Syndicat général des fondeurs de France), at a conference organised by the French pattern castings industry after the return of the industry's team from a visit to the United States, emphasised the fact that the United States industry had the benefit of long-term credits at low rates of interest, while in France such credits were rare and difficult to obtain.¹ In the Italian metal trades, too, where the renewal of plant and equipment is especially urgent, lack of capital and high rates of interest are serious obstacles to the growth of productivity.

**Taxation**

Taxation may adversely affect productivity in several ways. In the first place, rates of taxation on business firms may be so heavy

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as to leave them either with insufficient means or with little incentive to undertake new capital investment. This may especially be the case if the cost of equipment is rising rapidly and if formulae governing permitted deductions for depreciation do not take sufficient account of the fact that the replacement or renewal of capital equipment costs a great deal more than its original construction. Secondly, even if not unduly heavy, taxes may be assessed in such a way as to discourage productivity: the tax per horsepower formerly levied on motor cars in the United Kingdom led to a concentration on the production of low horsepower engines which was widely considered to have unfortunate effects on the ability of the British motor car industry to compete in export markets. Thirdly, if taxation of workers' earnings is so high as to reduce considerably the increment of income which they may earn through greater efforts, the extra efforts may not be deemed worth making and systems of payment by results will have little effect in promoting greater productivity. This is especially likely to be the case if goods on which to spend such part of additional earnings as is retained are in short supply.

Competent observers believe that the high level of taxation in the United Kingdom, for example, has impaired productivity in at least some branches of industry.\(^1\) It has been suggested that “a thorough recasting of the taxation system, in order to make taxes less deterrent to saving, hard work, investment and risk taking”, is one of the most urgent tasks confronting the British Government.\(^2\) The British non-ferrous metals productivity team associated the “productivity-consciousness” which it found throughout the United States industry with “incentive systems that are more effective in the U.S. because of lower taxation and adequate supplies of consumer goods . . .”.\(^3\) A report by the French Central Planning Commission (Commissariat général du plan de modernisation et d'équipement) referred to “the serious defects in [the French] fiscal system, which is complicated, costly and ineffective. Numerous taxes constitute real ‘internal customs duties’ which penalise production.”\(^4\)

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1. See, for example, A.A.C.P.: *Drop Forging; Internal Combustion Engines;* and *Grey Ironfounding* (London, 1950), pp. 7, 49, and 17 respectively.
Among institutional factors affecting productivity, few are more important than the extent to which the educational and vocational training facilities available in a country meet the requirements of industry. These include facilities for the training of all grades of personnel from top management downwards. It is perhaps in connection with training for higher management and in the training of scientists, engineers and technicians that industry is, however, most dependent upon outside institutions.

In many countries the conception of formal training for higher management is relatively new. Yet its importance can scarcely be exaggerated. Experience has shown, as one would expect, that efforts to raise productivity initiated by men in subordinate positions are unlikely to succeed without the understanding, support and encouragement of top management. It is important that higher management should have a thorough knowledge and understanding not only of the best methods of organising production but of how these are likely to affect the worker at the bench.

It seems clear that the knowledge, skill and enthusiasm displayed by American higher management are important factors making for high productivity in the United States. While these qualities in American management are no doubt partly products of the general American environment and way of life, it seems certain that they also owe a good deal to the emphasis which is placed in the United States upon training for management.

Problems of training for higher management arise both in universities and technical colleges and within industry itself. While in many countries university graduates still go largely into the professions, there is a growing tendency, particularly in the United States, to employ university graduates in industry. This seems clearly to be a source of strength to American management, and is to be encouraged in other countries.

Jealous of their academic standards and conscious of the difference between academic and vocational education, many of the older universities have, however, been slow to offer training aimed specifically at equipping students for business careers. Realisation of the growing complexity of business and administrative problems as subjects for study and of the possibilities of teaching such subjects not merely as vocational skills but in a scientific spirit is, however, modifying this attitude. This is especially true in the
United States, where in 1950 there were over 600 institutions offering degree courses in business and commerce and more first degrees were granted in these subjects than in any other.\(^1\) In addition, administrative studies are included in many other liberal arts and technological courses. On the other hand, almost every business course includes a substantial element of liberal arts subjects. A high proportion of the large number of students taking science and engineering courses also make their careers in industry.

The ability of American universities and colleges to provide courses that are recognised by industry as providing valuable training in management owes much to the close contact which is maintained between the universities and industry\(^2\), to the financial support which the universities receive from industry, and to the fact that university staff members are permitted, and indeed encouraged, to do part-time work in business. This reduces the inequality between academic and business rates of remuneration. Also, a teacher of business subjects is likely to be both a better teacher and more up to date if he keeps in close touch with the practical aspects of business.

Scientists, engineers and technicians have a key role to play in raising productivity. If it is top management which disposes, it is in large measure they who propose. Top management can seek in a general way to create conditions favourable to higher productivity and can give direction, encouragement and support to those whose work it is to introduce and apply the techniques needed for raising productivity; but it is the scientists and engineers on the staff of an undertaking, or outside experts whose services may be hired on a temporary basis, who command the knowledge and techniques needed for ascertaining how, in any particular situation, productivity can be increased, for making specific proposals and for planning in detail what should be done. Productivity therefore depends greatly upon the


\(^2\) "Business and the universities work very closely together and this is a major factor in the success of training for administration. The points of contact are many, and everywhere there is evidence of mutual understanding and helpfulness. There is also close co-operation between the trade unions and the universities which run courses for their officers." (Ibid., pp. 19-20.) A Netherlands study group which investigated methods of "management development" in the United States was equally impressed by the part played by American universities in the training of higher business executives. (See CONTACTGROEP OPVOERING PRODUCTIVITEIT: *Wie volgt ons op?* (The Hague, 1952), Chapter IV, pp. 35-44, and English summary, pp. 51-56.)
initiative, resourcefulness and fertility in ideas of industrial scientists, engineers and technicians.

It is important in all countries that a substantial proportion of scientifically trained men should be employed in industry. Degrees in science and engineering are not, however, designed primarily to equip their holders for careers in manufacturing industry. If scientific knowledge is to be effectively utilised and applied in industrial production it is believed that there is a need in many countries for more training in applied science.

The need for expanding facilities for training in industrial engineering and production engineering is of special importance. Industrial engineering has for many years been a field of study in a few American colleges; in recent years it has attracted great interest and the number of courses in the subject has increased rapidly.

There is considerable variation in the content of industrial engineering courses, but the usual pattern is one in which advanced engineering design and theory are replaced by such subjects as industrial economics, work analysis, industrial statistics, and personnel and labour relations.

Over 4,000 degrees were granted in this field in 1950, including some 900 higher degrees. Outside the United States, too, growing attention is being devoted to this kind of training.

The training of work study technicians is also of fundamental importance. A recent British report recommends, among other things, that—

(1) Every industrial manager should make it his job to study more closely the results that can be achieved from a wider application of work study and, in particular, the benefits obtainable from better training in the subject.

(3) Industry should be responsible for making known to local educational institutions the need for courses in work study, so that the number of courses set up in each area will be sufficient to meet industry's requirements.

(4) Local technical colleges and other educational and training bodies should, in conjunction with the professional institutions concerned, ensure that the courses provided are of the kind industry needs.

(7) It should be the aim of industry that all men practising work study should successfully complete a course at least as comprehensive as the one outlined in the syllabus [recommended by the authors].

(8) The examination standards for these courses should be laid down in consultation with the professional institutions concerned, as well as with industry.

(12) Once the proposed syllabus is established and accepted by the relevant institutions, these should jointly approach the Ministry of Education to seek an endorsement for the qualification connected with the course.¹

A fairly detailed syllabus has been devised and recommended by the authors.² It includes method and motion study, work measurement, the application of time standards, the organisation and administration of work study departments, human aspects of work study, and incentives and job evaluation. It is not suggested that this syllabus should be regarded as setting a rigid pattern. It is recognised that adaptations and modifications will be desirable to suit particular conditions, but it is felt that, unless the syllabus is covered generally and interpreted liberally with sufficient practical work, the training will not provide an adequate background for responsibility. A course based on this syllabus would probably require 100 hours of lecturing, another 100 hours of tutorial work and a considerable number of hours devoted to study work under actual operating conditions. As a full-time course it should be spread over at least three months, or as a part-time course over two years.

It is not only in connection with the training of executives, scientists and technicians that industry needs the co-operation of outside institutions. Apprentices and others undergoing training for skilled occupations are commonly required to attend courses at technical colleges. And apart from the facilities provided by educational institutions there is often a need for training facilities which, especially for small firms, can be provided efficiently only through action on the part of an industry as a whole. The vocational training of the various categories of workers, though it raises problems calling for action outside as well as within individual undertakings, can more conveniently be discussed in a later chapter.³ There is, however, one general point that should be made here. Vocational training should seek to meet the needs of the future as well as of the present. This requires foresight in

² Ibid., pp. 38-45.
³ See pp. 119 ff. below.
estimating future requirements for different categories of workers and different kinds of skill. National employment services should have the closest possible contacts with industry on the one hand and with vocational training establishments on the other, and should be in a position to collect and analyse such statistical and other data as will make possible reliable surveys of trends in the employment situation, on which estimates of future requirements for different kinds of skill can be based.

**Industrial Research and Exchange of Information**

Other important factors affecting industrial productivity are the facilities that exist for industrial research, the extent to which the results of such research are disseminated in a form in which they can be utilised and the extent to which they are in fact utilised.

Many productivity teams have drawn attention to the important part played by industrial research in promoting productivity in the United States. There is no evidence that basic scientific and technical knowledge is more advanced in the United States than in Europe, but there is evidence that such knowledge is, in general, more effectively utilised and applied in industrial production.

There is also evidence that European industrialists are becoming more conscious of the importance of research. In the United Kingdom there are now some 40 grant-aided industrial research organisations. A number of them have been founded only recently; others have greatly expanded their activities within the last few years. A recent development in France was the establishment at the beginning of 1952 of a research centre for raising productivity in the men's clothing industry *(Centre d'études pour l'accroissement de la productivité de la confection masculine)*. Its main functions are to give technical assistance and production engineering assistance to the industry, to maintain a statistical and economic service, to study markets, and to be a source of general information on types of machines and qualities of cloth. It has issued a detailed review of types of machines available for different jobs.

It is important in all countries that every effort should be made to encourage both basic and applied research, whether by individual firms, industrial research associations, independent research institutes, government departments, or at universities. Government-aided research may be particularly important in helping to
meet the needs of small firms and of most establishments in underdeveloped countries.

Organised labour, as well as employers, has in recent years taken a growing interest in the problem of promoting industrial research. In the United Kingdom, for example, some trade unions subscribe to the funds of industrial research associations and there is trade union representation on a number of these associations, including those dealing with footwear, printing and cotton.¹

Attention needs to be devoted also to the problem of disseminating research findings. In the report of the French Central Planning Commission already mentioned the lack of liaison between scientific research and industry was said to be prejudicial both to research and to the practical application of new processes and techniques. The lack of technical centres in a country in which small and medium-sized establishments predominate was said to render difficult the exchange of technical information and the spread of new techniques.²

The extent to which, and the speed with which, industry makes practical use of research findings are likely to depend a good deal upon the number of scientifically trained men in industry.³ The fewer there are of these the more important it is that the significance of research findings should be explained, and results disseminated, in language which is not unduly technical.

In the United Kingdom the steel founding productivity team reported that—

The urgent need for effective research on steel founding problems in Britain is now fully recognised, and need not be stressed here. What ought to be stressed is the paramount importance of having the right type of man to convey to the steel founders themselves what is already known, as well as the results of researches and precise recommendations for their practical application.⁴

This emphasis is echoed in a number of other productivity-team reports. The same team reported that the Steel Founders’ Society of America, at whose instance the bulk of American research into

² Programme français pour l’accroissement de la productivité, op. cit., p. 13.
³ In a study of industrial research in Switzerland it is reported that "the ability and speed with which new scientific and technical knowledge, whether discovered inside Switzerland or abroad, is harnessed to the service of its industry is undoubtedly due in large measure to the strong cadre of university-trained scientists and technologists in, or associated with, Swiss firms". (Ronald S. Edwards and Charles La Roche: Industrial Research in Switzerland. Its Institutional and Economic Background (London, Pitman and Sons, 1950), pp. 72-73.)
⁴ Steel Founding, op. cit., p. 40.
problems connected with steel castings is carried out, makes a point of putting the results of research into simple language and getting them into the hands of the men on the job. In this task the technical and trade press has an important part to play.

It is not only new research findings that need to be more widely disseminated. There is usually, in any industry, a wide spread between the level of productivity in the most efficient and the least efficient establishments. This is usually true within a country, and still more as between one country and another. A levelling up of productivity in the more backward establishments towards standards achieved in the more progressive ones would greatly raise average productivity in an industry as a whole. Ignorance on the part of the less efficient undertakings even of methods and techniques which are well known and have already proved their worth in the more efficient undertakings, though by no means the only reason, is an important reason for the great differences in productivity that are found to exist.

Ways and means of dealing with this difficulty and encouraging the fruitful exchange and dissemination of information include the organisation of visits to other plants and establishments, in the same country or in other countries. The numerous visits of productivity teams sponsored by the Economic Co-operation Administration and the agencies which have succeeded it have been the most familiar form of expression given to this idea in recent years. It is desirable to include workers as well as managers and technicians in such teams, so that workers can participate in the formulation of recommendations and in the work of publicity and education that should follow such visits if they are to yield their full results.

A difficulty sometimes encountered in connection with the organisation of such visits, and also in connection with other techniques for promoting the exchange of information, is the reluctance of manufacturers to reveal trade secrets. Many of the European productivity teams that have recently visited the United States were impressed by the freedom with which information is commonly exchanged even between competing firms in United States industry, and contrasted this with the greater secrecy which tends to prevail in their own countries. The attitude of many

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1 Cf., for example, A.A.C.P.: *Simplification in Industry* (London, 1949), p. 10: "We found a greater readiness amongst American manufacturers to share their technical knowledge and to discuss production methods with other manufacturers, whether competitors or not, than is general in the United Kingdom. It is their conviction that all derive great benefit from this interchange, and no one loses."
European industrialists towards the exchange of information appears, however, to be undergoing a slow transformation. The Netherlands Government, for example, has reported that not only is better use now being made in Netherlands industry of the technical knowledge and experience of other countries but greater co-ordination of the knowledge, experience and initiative available within the country is also being achieved. Industrial firms which were formerly highly secretive about their production methods are reported to be gradually realising the benefits of the exchange and pooling of techniques and to be less reluctant to co-operate with one another in this respect.¹ A French manufacturer of electric motors, who was selling his products at a price 17 per cent. below that of his competitors, recently invited them to go through his plant and observe his operations.

The organisation of demonstration projects and national and international conferences and meetings are other methods of disseminating more widely the knowledge of good industrial practice.

Several productivity teams have referred to the important part played by the technical and trade press in the United States in disseminating information about productivity. In some countries, however, it would appear that the technical press does not fully exploit its opportunities. In a recent survey by the Economic Co-operation Administration of productivity in France it was stated that existing trade and technical periodicals were designed for the highly qualified engineer only and were of too restricted a circulation to be generally effective. It is believed that a reorientation and enlargement of industrial journals could do much to stimulate a vigorous productivity effort.

Much can be done, too, to promote a valuable exchange of information by national productivity centres which, besides acting as clearing houses for information and providing technical advice and services to industry, may also play an important role in co-ordinating research in the field of productivity and providing international contacts. Such centres, as has been said, have now been set up in a large number of European countries, and in some other countries, and it has been suggested that consideration should be given to the establishment of similar centres in underdeveloped countries, which might well combine work on general problems of

¹ De Productiviteit in Nederland, Overdruk van een Nota (The Hague, Staatsdrukkerij- en Uitgeverijbedrijf, 1951), pp. 33 ff.
economic development with work specifically designed to promote higher productivity. The difficulty that many underdeveloped countries lack qualified personnel to staff such centres could be met, in part at least, through technical assistance, experts training local personnel to carry on their work after the completion of their missions\(^1\), and local personnel acquiring training also through technical assistance fellowships tenable in advanced industrial countries.

\(^1\) I.L.O. Technical Assistance experts have, for example, worked in close co-operation with the staff of the Israeli Institute of Productivity. They have at the same time assisted the Institute with projects on which it was engaged and devoted a good deal of time to technical seminars and other forms of training for the staff.
PART II

PRODUCTIVITY WITHIN THE UNDERTAKING
CHAPTER IV

PLANT AND EQUIPMENT

While it is important to do everything possible to bring about and to maintain an environment which, psychologically and economically, favours higher productivity in manufacturing industries, it is within individual undertakings that productivity has actually to be raised.

There is general agreement that primary responsibility for action to raise productivity in individual establishments rests with management, but that the active co-operation of workers and their representatives is indispensable. Success in obtaining the co-operation of workers in measures to raise productivity is itself a test of the quality of management, but depends also upon trade union leadership.

Higher productivity in industrial establishments calls for action in various fields, three of the most important of which may be distinguished, not without some overlapping, under the headings: plant and equipment, organisation and control of production, and personnel policy. The present chapter is concerned with action under the first of these headings; the other two will be dealt with successively in the next two chapters.

THE AMOUNT OF CAPITAL PER WORKER

Probably no single factor has a more important effect on the productivity of labour than the amount of capital employed in conjunction with labour. “To get real, appreciable, material progress, capital is the first priority. That is a common ground . . . between Moscow, Belgrade, Chicago, London, Delhi and Pekin.” ¹ The more capital-intensive methods of production in the industrially developed countries account in large part for the enormous difference between the productivity of labour there and in underdeveloped countries. The greater mechanisation of industry in

the United States largely accounts for the superior productivity of labour in the United States as compared with Europe.

Motive power per worker, expressed in terms of horsepower or kilowatts, affords an index, though a very imperfect one, of the amount of capital per head used in production.\(^1\)

In the United States—

The gain in output per man-hour in manufacturing since 1899 appears to have been related fairly closely to increased use of power per worker. . . . Manufacturing output has corresponded roughly to the product of an installed-horsepower index and the length of the work week.\(^2\)

Dr. Rostas has shown that—

. . . the ratio of horsepower per worker in the U.K. and the U.S. bears the same relation as the ratio of output per worker in the U.K. and the U.S.; i.e., broadly speaking, output per worker is double in the U.S. and horsepower per worker is also double. Also the higher rate of increase in horsepower per worker in the U.S. runs parallel with the higher rate of increase in output per worker. . . .\(^3\)

The article in the *Economic Bulletin for Europe* mentioned above confirms the importance of the amount of capital per head as a factor affecting the productivity of labour. A study of censuses of production (mostly for pre-war years) in 18 European countries and the United States showed that there is a close relationship between horsepower per head and the value of net output per head in manufacturing—in countries where horsepower per worker is high, over-all net output per worker also tends to be high.\(^4\)

Findings such as these suggest the question whether differences in the amount of capital per head are not indeed so important as factors accounting for observed differences in the productivity of labour as to leave little more to be accounted for and to deprive other factors of any considerable importance. The facts do not,

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\(^3\) Rostas, op. cit., p. 52. Dr. Rostas’s comparisons are based on pre-war figures, but studies relating to the post-war period, undertaken by the Anglo-American Council on Productivity, confirm that the amounts both of electric power per industrial worker and of horsepower per operative are two or three times as great in the United States as in the United Kingdom. (Cf. A.A.C.P.: *Report of the Second Session*, London, Mar.-Apr. 1949, p. 6.)

however, support the view that differences in the amount of capital per head, important as they unquestionably are, are the only important factors affecting labour productivity. The conclusions quoted relate to manufacturing industry in general and are based upon broad averages of horsepower per worker and of output per worker in a considerable number of separate industries. In the process of averaging, cases in which relatively high output per worker is associated with relatively little horsepower per worker tend to cancel out cases in which relatively low output per worker is associated with relatively high horsepower per worker. A study of the relationship between output per worker and horsepower per worker in individual industries reveals a variegated picture. Rostas computed indices for 28 industries both of the ratio of horsepower per worker in the United States as compared with the United Kingdom and of output per worker in the two countries; he found that in six of them there appeared to be a close inter-relationship between the two indices in the sense that in the United States $x$ times the British horsepower per worker was associated with $x$ times the British output per worker; on the other hand there were 14 industries in which the United States employed disproportionately more horsepower per worker in order to achieve a higher output per worker, and eight industries in which the United States lead in productivity was disproportionately greater than its superiority in horsepower per worker.

Rostas consequently insisted that “no great importance should therefore be attached to the fact that in the [over-all] U.K./U.S. comparison the ratio of productivity corresponds to the ratio of horsepower per worker”.

In the study published in the *Economic Bulletin for Europe* the relationships between output per worker and horsepower per worker obtaining in individual industries are not shown. The over-all comparisons, while confirming that high output per worker tends in general to be associated with a high level of horsepower per worker, still left a good deal to be explained by other factors. For example the value of net output per head in Ireland was found to be about double that in Finland though horsepower per head in Ireland was only about half that in Finland—this despite

1 In two of these industries—cement and fish curing—output per worker was actually higher in the United Kingdom, though much more horsepower per worker was employed in the United States.

2 Rostas, op. cit., pp. 53-54 and 69-70.

3 Ibid., p. 53.
the fact that actual amounts of horsepower were replaced by "standardised" figures designed to eliminate the effects of differences in the industrial structure of different countries, i.e., of differences in the proportion of workers employed in industries using much and little capital respectively.¹

Studies of the relationship between output per worker and horsepower per worker thus appear to confirm the common-sense judgments that a worker helped by machines will normally produce more than a worker operating with little or no machinery; that the amount of capital per worker is one of the most important factors affecting the level of labour productivity; but that differences in the amount of capital per worker are not sufficient to account for observed differences in labour productivity, and that other factors also have an important influence upon this.

Moreover, the importance of methods of increasing productivity without additional capital investment becomes all the greater when one reflects that there is nothing especially significant or meritorious about achieving the maximum productivity of labour alone in any particular establishment or industry (since this can be done by methods which, from the point of view of the economy as a whole, involve a disproportionate and excessive increase in the "input" of other factors of production), and that what is chiefly important is to make the most efficient use of all resources taken together. This means that capital and labour should be combined in different proportions in different countries, in such a way as to take account of differences in the degree of scarcity of these two factors. It may, however, be agreed that even from the point of view of this more fundamental objective (making the most efficient use of resources in general rather than maximising the productivity of labour in particular) capital investment is often not carried as far as it should be.

Differences in the quality, size, type and efficiency of capital equipment from one plant to another are quite as important in their effects on productivity as differences in the actual amount of equipment per worker. Indeed, since capital equipment cannot be measured in terms of homogeneous physical units, it is difficult to separate the notion of quantity from the notion of quality.

Difficulties encountered in connection with the installation of new machinery or equipment include the following:

(1) The necessary capital goods may not be available. This

may apply not only to large machines but also to lesser equipment such as power-driven hand tools. High productivity is as much a cause as a consequence of the availability of machine power. Only a nation whose productivity is already high can add rapidly to its supply of machinery.

This is a problem very likely to be encountered by manufacturers who have to import the capital equipment they require. In some cases there may be room for more initiative by potential domestic suppliers of equipment, and this might be encouraged by means of surveys of requirements aimed at establishing the size of the domestic market for such equipment.

Manufacturers in underdeveloped countries encounter certain special difficulties arising from the fact that most manufacturing equipment originates in the larger industrial nations and is usually designed for the production conditions prevailing in these countries. The size of markets, raw materials used, the size of plants, operating conditions and maintenance arrangements may all be different in underdeveloped countries from those for which the kinds of equipment normally available have been designed.

Production experience in a number of underdeveloped countries has frequently revealed that local conditions do not suit the optimum operation of such machinery, and the need has often been expressed for the development of equipment and factory plans adapted to the special conditions of these countries. In some cases it has even occurred that natural resources are untapped because new types of industrial plant need to be specially developed. Since most small countries cannot afford the cost of expensive original development work and have neither the engineering staffs nor the volume of production needed to originate satisfactory substitutes, international co-operation could be extremely helpful in this sphere.¹

(2) The market may not be large enough to enable amortisation and depreciation charges to be spread over a sufficient number of units of output to warrant investment in expensive equipment. Here two cases need to be distinguished—

(a) The domestic market, supplemented by any other markets to which access is available, may be too small to support even one undertaking of the technically optimum size (e.g., in a small and poor country setting up an integrated steel works); but on the whole this case seems likely to occur rather seldom.

(b) The market may be large enough to support one or more undertakings of the technically optimum size, but may, in fact,

be shared among a considerable number of smaller undertakings, none of which has a large enough share of the market to warrant additional capital investment of an expensive kind.

In the first case, there will be no remedy, given the existing state of technique, short of an increase in demand. The existence of the second case is evidence of imperfect competition—otherwise the more efficient undertakings would undersell the others, encroach upon their share of the market and in that way obtain the additional sales they need. In such cases, therefore, action against the devices by which competition is restrained—price maintenance agreements, quotas, cartel arrangements, etc.—may promote efficiency. Such action may be taken either by the more enterprising undertakings themselves or by governments.

In neither case need the size of the market be accepted as given. Action may be taken to increase demand both by reducing prices and by means of vigorous salesmanship.

(3) Methods of production may not be sufficiently standardised to warrant investment in additional capital equipment. While the size of the market limits the opportunities for specialisation and standardisation, much may often be done within any given market situation to take fuller advantage of these opportunities.

(4) More generous allowances for depreciation and obsolescence, and a reduction in rates of taxation on profits, especially where these are very high, would ease the problem of manufacturers for whom equipment is physically available but financially out of reach. So also would any steps that could be taken to make loan capital and share capital available on easier terms.

(5) Even when the equipment they require is available and could be afforded, manufacturers may not always know what is the best equipment to select for their particular purposes. This is perhaps especially likely to be the case in underdeveloped countries.

The development of improved forms of new equipment is very rapid. Unfortunately, knowledge of such new and superior types spreads slowly throughout the world, and in many cases new investment is made in obsolete types or models because of an imperfect knowledge in the field. Moreover, sometimes because of established practice and familiarity with the use of single-purpose or manually operated tools with low-speed operation, an industrial undertaking building a new plant may deliberately avoid the use of more efficient machinery. This widespread tendency is extremely costly in terms of loss of potential productivity, since the purchase of low-efficiency machines may freeze productivity levels for a number of years.¹

¹ Methods to Increase World Productivity, op. cit., p. 11.
While this is true and important, it is worth repeating that, given the very different ratios prevailing between the prices of capital and labour in highly developed countries and underdeveloped countries respectively, the capital-intensive and labour-saving methods of production that are appropriate in highly developed countries will not necessarily be appropriate in underdeveloped countries. The importance of adapting equipment and techniques to local conditions, so as to ensure full utilisation of local resources, cannot be over-emphasised.

(6) Difficulties may be encountered in persuading workers to accept new machinery, or to accept a reduction in the labour complement attached to the machinery. Since the whole superiority of one machine over another may lie precisely in the fact that, by reducing the amount of work to be done, it enables a worker to look after the machine with less assistance, or to look after more machines, success or failure in securing the co-operation of labour will be of paramount importance. This problem in industrial relations will be discussed in Chapter VI. Full consultation with workers, advance notification of expected displacements and agreed procedures for dealing with displaced labour are highly desirable.

The full advantages of mechanisation will not be secured, especially in a country in which industrial development is at an early stage and capital equipment is scarce, unless mechanisation takes place as part of a sound investment plan for the development of the economy as a whole.

Too frequently . . . plant modernisation is undertaken in the complete absence of long-range plans, and new equipment is bought in a "hit or miss" manner to satisfy current needs. Unrelated items are often procured which cannot be successfully integrated with other equipment in later years. A more efficient procedure would involve thorough studies of the limitations of present equipment, and the direction of new purchases in a manner which, over a given period, would accelerate the transition towards fully integrated facilities. The need for technical guidance in this important sector of investment is particularly great in underdeveloped countries and might be met at least in part by consulting engineering services associated with the work of a national productivity and developmental centre.1

Problems of integrating the capacities of different types of equipment arise not only at the national or industrial level but also at the level of the plant. In installing new equipment close

1 *Methods to Increase World Productivity*, op. cit., p. 12.
attention must be paid to the development and maintenance of a correct balance in the productive capacities of different departments in order to avoid bottlenecks.

**Materials-Handling**

In many factories 50 tons of materials are lifted, moved, loaded, unloaded, reloaded, etc., for every ton of finished product produced. Handling costs may amount to anything from 15 per cent. to 85 per cent. of total production costs. Here is a large and fruitful field for economies, which may be achieved (a) through carefully planned layout, ensuring a proper sequence of operations, and (b) through mechanisation. It would appear that in many industries the modernisation of equipment should often start with the mechanisation of materials-handling.

Four principles of good materials-handling, quoted in the report of the Anglo-American Council on Productivity team which investigated this problem, are—

1. Eliminate manual handling wherever possible;
2. Avoid re-handling;
3. Use equipment that sets a uniform pace;
4. Palletise and use unit loads.

In some cases the installation of equipment to give effect to these principles may require complete reorganisation and heavy capital investment, and may be impossible in the short run; in other cases there may be opportunities for increasing productivity considerably by more effectively utilising equipment that is already available or that can be procured at relatively little cost. The materials-handling productivity team believed that “a steady uninterrupted flow of materials to and from each workman will on the average raise productivity by at least 15 per cent., using existing productive machine equipment”.

1 The productivity team from the French pattern-casting industry quoted a figure of 100 tons of materials handled for every ton of good castings produced, and stated that they had seen United States foundries in which only one-fifth as much labour was required as in France for receiving and storing materials (Recueil de documents relatifs à la productivité, op. cit., p. 41).
2 A survey of labour productivity in the production of pig iron in Japan gives as one of the major reasons for the relatively large number of man-hours required per ton in Japan, as compared with the United States and the United Kingdom, the fact that the internal transport of fuel and raw materials is only partly mechanised (Asahi Shim bun (Tokyo), 27 May, 1953).
4 Ibid., p. 5.
This team found that the best materials-handling equipment observed in the United States consisted mainly of variations on the hoists, cranes and conveyors well known in Europe. What was striking about them was how ingeniously they had been worked into the materials-handling plan. A similar point is made in the reports of several productivity teams which investigated particular branches of industry.

The British steel-founding productivity team, for example, reported that in United States foundries the wheelbarrow was almost extinct, much of the barrow work being done by fork trucks. Roller conveyors were used not only for transporting boxes and moulds, as in the United Kingdom, but also for such purposes as moving heavily laden skips across parts of the floor out of reach of the crane. An alternative to roller conveyors was the wheeled skid, on which several moulds could be placed. The most striking point observed in the use of gantry cranes was the speed at which they work. In hoist, traverse and travel they move much faster than is usual in the United Kingdom. Magnets are used to a much greater extent, and a most effective time-saving technique is that of “snatching” the casting with the magnet. Strident hooters keep the way clear under the crane path, and the absence of any attendant to guide the magnet to the castings ensures freedom from injury when castings spin themselves out of the first grasp of the magnet. Wall travelling cranes are also used in some foundries, and jib cranes are more plentifully installed than in British foundries.¹

In the United States drop-forging industry—

Mechanical handling is an important factor in high productivity. The American dictum is not to put anything on the floor, as somebody must be paid to pick it up. In the large plants elaborate conveyors are used, but even in the smallest shops, where little mechanical handling was in evidence, the intelligent use of wheelbarrows saved much time and cost.²

The Belgian forging and stamping productivity team which recently visited the United States was equally impressed by the importance of the contribution made by well organised handling arrangements to productivity in American forges and recommended this matter to the attention of Belgian industrialists.³

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¹ Steel Founding, op. cit., pp. 15-16.
³ FABRIMÉTAL: Bulletin hebdomadaire d'information et de liaison (Brussels), No. 255, 14 May 1951, p. 388.
The British metal valves productivity team regarded as most important their recommendation to “mechanise more extensively the handling of valves and components”\(^1\). They stated that the United States valve industry was far ahead of the British industry in effective handling of materials.

A good deal of attention has been devoted in Europe in the last few years to questions of materials-handling and internal transport. A Dutch report, for example, reviewing the progress made in the Netherlands recently in achieving higher productivity, states that “the majority of improvements have been in the field of internal transport”\(^2\).

**Power-Driven Hand Tools**

Much may sometimes be done to increase productivity by the use of inexpensive equipment such as power-driven hand tools. These have the double advantage of both saving time and reducing fatigue. The British materials-handling productivity team reported that—

Enquiries were made about the time saved by the use of power-driven tools. All plant managers agreed that it was considerable. From many instances we quote three.

\((a)\) On an assembly where seven 3/16-inch diameter screws had previously been driven by hand with a “Yankee” type screwdriver, the introduction of a power screwdriver made a saving of 48 per cent. in time.

\((b)\) A machine operator had to tighten four 1/2 inch diameter bolts on a work-holding fixture, the screws being slackened off at the completion of the operation. The use of a pneumatic impact wrench resulted in a time saving of 45 per cent. and reduced operator fatigue.

\((c)\) On another assembly for electrical connections, plugs were driven into sockets by a small pneumatic hammer fitted with a tool for easy and quick insertion of the plug connector and its electric lead. This operation was formerly done by hand and was slow and difficult. With the pneumatic hammer the job was speeded up 65 per cent. and operator fatigue practically eliminated.

We are convinced that a wider and more intensive employment in British factories of electric and pneumatic power-driven hand tools would help to increase productivity and reduce physical effort to a minimum. The maintenance facilities of tool, plant and building departments would also be improved and costs reduced.\(^3\)


\(^3\) *Materials Handling in Industry*, op. cit., pp. 33 and 37.
The French electrical construction team was impressed by the part played by mechanised hand tools, particularly in the manufacture of light products, in the United States electrical construction industry. These small tools are not expensive in the United States, and the high cost of labour makes their utilisation all the more advantageous. The team added that it would be very difficult to obtain such tools in France; either they are not made or they are too dear.\(^1\) The team from the French pattern-casting industry likewise found the widespread use of electrically driven hand tools to be one of the factors making for high productivity in United States foundries.

**Maintenance**

The importance of careful maintenance of machinery, and especially of preventive maintenance, is stressed in many of the reports of the Anglo-American Council on Productivity, and in the reports of teams from other countries, for example those from the French electrical construction and machine-tools industries. One example, from the British drop-forging report, will suffice—

American maintenance is carried out on the principle that "a stitch in time saves nine". Machines are overhauled at definite intervals, and though some of the plant seen was over 20 years old its condition was good. Breakdowns are regarded as unavoidable but a distinctive feature of American practice is that an adequate labour force makes quick replacement from an ample stock of spares. It is recommended that maintenance be improved in England and that increased stocks of spares be carried wherever there is need for frequent replacement.\(^2\)

Well planned maintenance schedules and specialisation of maintenance functions are important. If, however, maintenance work is carried out exclusively under the orders of maintenance engineers or maintenance supervisors, there may be unnecessary delays in attending to or forestalling breakdowns. In some large undertakings good results have been obtained by decentralising maintenance personnel, integrating them in the production services and leaving them subject to directives from the maintenance engineers on technical matters only.

Special problems of maintenance may arise in underdeveloped countries owing to the shortage of skilled labour and the fact that the labour force in general may have had little experience in

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\(^1\) Recueil de documents relatifs à la productivité, op. cit., pp. 35 and 41.
\(^2\) Drop Forging, op. cit., p. 8.
handling machines. In small establishments maintenance may sometimes be carried out, at least in part, by ordinary production workers; in such cases it is extremely important that they should receive adequate instruction and supervision in this work.

In some countries and in some industries producers of machine tools might make an important contribution to higher productivity by developing maintenance services especially for the benefit of small user factories which are not easily able to maintain their machines as they should.

**Plant Layout**

The importance of plant layout in connection with the economical handling of materials has already been emphasised. Good layout can not only eliminate needless transport and handling when work passes from one department to another; it can also facilitate within each department a synchronised flow of materials or parts so that each machine and each worker is fully employed and each operation dovetails with the next.

While an ideal layout generally requires appropriately designed buildings and may therefore be unattainable without extensive alterations or new premises, a good deal may often be done within existing premises to rationalise the flow of materials and semi-finished products. For example, in United States diesel locomotive plants—

... there is no hesitation in re-grouping machines, equipment or work stations in order to achieve the minimum of movement and the greatest concentration of effort. It was generally observed that machine tools and equipment are rarely made permanent either by securing to floors or coupling to power supply. This practice is, of course, not unknown in Britain.\(^1\)

As an example of the handicaps imposed by bad layout, and of what may be done to circumvent them, the following passage may be quoted from the report of the British steel-founding productivity team:

Many of the steel foundries in Britain have grown haphazard into a jumble of buildings in which it is difficult to follow the sequence of operations, let alone design an even flow of work. It is a long-term matter to reconstruct them, but the choice is surely clear—either they are put into more efficient form, or they come under the hammer pre-

pared for the inefficient. That it will be a slow business getting the new layout into shape is all the more reason for starting now. The problem becomes no easier by waiting.

Long-term policies, however, will not give quick enough effects. Even within existing shops methods of production of steel castings can be made easier by rearranging the work. There is a common practice in jobbing foundries of allowing a moulder to do his work all over a certain area. He moves from job to job, and every move means that his requirements must be brought to a different place. American practice and the best practice in Britain puts even jobbing work on the production line to the extent that the moulder and his supplies have a fixed location, where work moves to him for completion, and away from him to the next stage. (This, of course, applies to small and medium-size work only.) Similarly, in other departments of the foundry, rearrangement of machinery and workbenches can reduce the amount of handling to be done, and simple means can be devised to reduce the unnecessary handling which is incurred because castings are piled on the floor and must later be put into skips for removal farther along the line of production.¹

¹ Steel Founding, op. cit., p. 37.
CHAPTER V

ORGANISATION AND CONTROL OF PRODUCTION

Most of the measures discussed in this and the next chapter provide opportunities for raising productivity with little or no additional capital investment. To those who believe that higher productivity is mainly a matter of installing more and better machines, such measures may seem to be of relatively minor importance. If one is thinking of the productivity of labour alone, increasing the amount of capital per worker is no doubt one of the most important of all ways of raising productivity, but even from this point of view it would be a mistake to neglect what can be done by other means. For one thing, the shortage of capital in many countries (including some which cannot be described as underdeveloped) is so acute that the question of what can be done to raise productivity without additional capital is of special practical importance. For another, the scope for raising labour productivity by such means appears to be much greater than is often believed, particularly perhaps in underdeveloped countries. A recent survey of labour productivity in the cotton textile industry in five Latin American countries—Brazil, Chile, Ecuador, Mexico and Peru—divided the causes of low productivity of labour into two main groups, namely: (a) causes which could only be eliminated by modernisation of machinery and enlargement of the mills; and (b) causes which could be remedied by administrative action, i.e., by making a more efficient use of existing equipment. The authors came to the conclusion that for the five countries as a whole the two groups of causes were about equally important, and that for two countries (Brazil and Ecuador) the latter group of causes was the more important.¹

This conclusion is of interest because it shows that what has been termed the “backwardness” of the Latin American textile industry

and has been generally attributed entirely to equipment, is partly due to the lack of organization and administration in the mills, although these conditions . . . do not depend merely on the will, or on the administrative capacity, of the manufacturers.

Professor I. B. W. Berenschot, however, who draws a similar distinction between technical measures (which usually require substantial capital investment) and organisational measures for increasing productivity, believes that, in general, the first are about three times as important as the second in increasing productivity.1

The importance of methods of increasing productivity without additional investment becomes all the greater when one thinks in terms not of labour productivity alone but of making the most efficient use of all resources taken together. In underdeveloped countries especially, lack of capital and abundant labour often make it more important to increase output per machine or per unit of capital than output per worker.

**Management and Administration**

The quality of management affects productivity in a great number of different ways; "... while material progress is affected by numerous circumstances, it is fertility in resource and imaginative enterprise which lie at its root ".2 Progressive management will seek continuously to improve upon and not merely to imitate techniques and installations in use elsewhere.

Nearly all the Anglo-American Council on Productivity reports pay tribute to the quality, skill and enthusiasm of management in the United States, and remark on the technical knowledge, familiarity with problems of production and informality displayed by the higher levels of management. This they felt made for a better team spirit in the plants and also accounted for the high respect accorded to management by the manual workers. "The most significant factor in America leading to high production at low cost ", in the opinion of the management accounting team, "is efficient management ".3 A team of British trade union officials concluded that "efficient management set the pace of productivity in American industry—not because of altruistic belief in social progress, but from necessity ".4

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4 *Trade Unions and Productivity*, op. cit., p. 51.
Every aspect of the work of an undertaking is, of course, under the control of the management (or of the directors where there is a separation between management and direction). Suffice it to say here that features of United States management that have attracted the special attention of visiting productivity teams, and which they have commended to the notice of managements in their own countries as factors making for high productivity, include the trouble taken in United States industry to educate, train and develop management officials of all ranks; the high degree of devolution of authority and responsibility; the fact that foremen and supervisors are generally regarded as belonging to the ranks of management and remunerated accordingly; the clear definition of jobs and responsibilities; the general willingness to exchange information and "know-how" even among competing companies; the readiness to try out new ideas; the attention given to the planning of production; the effective way in which management uses the services of accountants and controllers; and the importance attached to salesmanship and to the dovetailing of the work of the sales department with that of the planning and production departments.

Production Planning and Control

The planning and control of production are of course essential in order to ensure that delivery dates are met, that materials and components are available when and where they are required, and that workers and machines are neither overloaded nor left idle. Better planning of production schedules may, among other advantages, help to reduce irregularities in production and employment arising from seasonal and other fluctuations in demand. Better production control can do much to eliminate imperfections in materials, implements and machines, which may have adverse effects on productivity out of proportion to their intrinsic importance.¹

The actual techniques of planning and control adopted must depend upon the size of the undertaking and the type of work carried on in it. A number of productivity teams have commented on the care and effort commonly devoted to production planning in United States industry, and have recommended that more attention be devoted to this matter in their own countries. The British lithographic printing team, for example, reported that—

¹ Cf. p. 143 below.
A system for scheduling production and control of the work-flow is a development which pays for itself in better use of man-power and equipment, simplification of overseers' duties, better understanding of the job by the workers, prevention of over-manning, reduction of overtime and of rush work. It is impossible to work out a system in the abstract because it must be built on operating conditions in individual factories; once formed it will require continual adjustment. . . .

Recommended that production control systems be studied and developed, bearing in mind that:

(a) Control techniques must return in increased efficiency more than their cost of installation and operation.

(b) Rigid control systems will not generally work well. Responsible operating personnel must be ready to make adjustments to meet changes in the day-to-day situation.1

Methods of planning used in sections of the United States electrical manufacturing industry are described as follows in the report of another British team:

In order to plan in outline their manufacturing programme some months ahead, most of the concerns visited rely on statistics based on sales forecasts for each of the many classes of product they may manufacture. The forecasts are prepared by the appropriate sales divisions and related to past experience and the productive capacity of the manufacturing departments.

The planned production levels for each class of product for the given period ahead are compared with the corresponding levels of the period just completed and expressed as ratios by which to vary the re-ordering levels of components, sub-assemblies and finished stock. The levels are also used to indicate a suitable policy on labour recruitment, labour transfers and redundancy.

As to more detailed production planning, it is common practice to keep an up-to-date record of the load of work outstanding in each assembly section for the purpose of reviewing promised completion dates and plant and labour distribution. . . .2

Important as it is to plan and control production, some systems of production control appear, however, to be unnecessarily complicated and expensive. It is desirable that the number of forms and records be kept to a minimum, and that as little clerical work as possible be called for from foremen, so that they can concentrate on production.

Where a production planning department exists, its relations with line superintendents and foremen sometimes give rise to friction. Such difficulties may be reduced by a clear definition of responsibilities, and by ensuring that production planning personnel have not only adequate technical knowledge but ample

experience of the practical problems that arise in the day-to-day operation of a factory. If foremen and supervisors are relieved of all responsibility for planning, and are left with no other function than to supervise the execution of plans laid down for them, not only may production plans prove to be too rigid to meet unforeseen circumstances but the status and responsibilities of foremen and supervisors may suffer and they may have difficulty in getting the best work out of those working under them. The British Institute of Management has recommended that "the foreman . . . be left with flexibility of method so as to get the best out of his shops".  

While there must be adequate control, so that those in responsible positions know what is going on, a general danger associated with undue reliance upon rules and controls, not merely in the field of production planning but in all fields of management and administration, is indicated by W. F. Whyte in the following words:

There seems to be a tendency in some organisations to seek to get results from the establishment of an elaborate set of controls. Men in the organisational hierarchy devise detailed directives and reporting systems, while specialised functionaries are provided to check up on performance and enforce the rules. This emphasis upon controls and rules leads people in subordinate positions to spend a large part of their time in giving the appearance of conforming to rules and directives, and avoiding censure of their superiors. It takes attention away from the production problems the manager faces in his immediate working environment. The executive who can shift the emphasis off controls toward the means of developing co-operative relations will thereby enable people down the line to do a more effective production job.

**Costing and Budgetary Control**

A number of productivity teams have emphasised the importance of the contribution that cost accounting can make to the efficiency of management, particularly if costs are compared at regular intervals not merely with the past but with budget forecasts based upon standards of performance. Such comparisons show up failings and shortcomings, suggest action that may be taken to correct them, and afford important guidance in planning for the future. The British management accounting productivity team recommended that "management, in considering the future

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and preparing plans, should make the fullest use of budgeting and forecasting, based on accounting and costing data”.¹

Costing and budgetary control may also facilitate the delegation of authority and responsibility. If targets can be set in respect of work under the charge of subordinate members of the management team, and if performance can be regularly compared with the targets, higher management may more confidently leave routine matters to subordinates, intervening only if something goes wrong. Another recommendation of the British management accounting productivity team was that—

... top management should make use of standards of performance and of accounting control techniques to enable it to decentralize responsibility, and that all standards of performance should be agreed with those who are to work them.¹

Costing may also serve to promote “cost consciousness” at all levels of the undertaking. In United States plants visited by the British drop-forging productivity team—

The man in the shop was frequently informed of the cost of the tools he was using and of the running overheads of his machine, so that he took an interest in trying out new ideas to reduce costs. Moreover he realized that the difference between his piece rates and the selling prices of the forgings was not all profit to the company...²

Accurate cost accounting, if it is reflected in selling prices, may also serve to discourage special orders when a closely similar product is available, and to concentrate demand upon a narrower range of types and varieties.

Yet another, though incidental, advantage of cost accounting is that suitable systems can often be extended at little expense to yield measurements of labour productivity. The output figures required for productivity statistics can in many cases be arrived at automatically by suitable arrangements of the cost accounts; man-hour figures can be obtained as a by-product of the pay-roll analysis required for the cost accounts.³

In United States industry in general, the financial accounting and costing functions are strongly represented at top executive level.

The main differences between cost accounting in America and Europe lie not in the accounting techniques but in the purpose for

¹ Management Accounting, op. cit., p. 16.
² Drop-Forging, op. cit., p. 46.
which cost accounting is used, the extent to which standards and budgets are used and the widespread demand of management for cost accounting services to meet its need.¹

Both managements and accountants realise that the primary purpose of accounting and costing should be to guide management in planning for the future. The interpretative function of accounting has accordingly been developed to a high level and the purely recording function relegated to a subordinate position.² This is reflected in the evolution, characteristic of United States industry but not as yet of European industry, of the office of controller, to whom the chief accountant is subordinate, and who is responsible not only for the speedy and accurate production of cost reports and financial statements but for the interpretation of these figures.

The controller's department is looked upon as an essential service to production. . . . From top management to foremen and charge-hands there is little fear of figures and there is a marked ability to absorb information from tabular or graphical form. . . . Each man is expected to do his job and to meet his budget, or else have a very good explanation. . . . The actual techniques used to obtain the accounting and costing information are not new, but the application of the technical principles and the speed and service which the controller gives to the management are outstanding and impressive.³

The O.E.E.C. report which has already been quoted recommended that in Europe the conception of controllership should be encouraged.

A costing system, like many other techniques to aid management, is a good servant but a bad master. Too much form-filling and paper work, resulting in the provision of cost figures too detailed to be readily digested and acted upon, may be as bad as no costing. This is a danger to which some productivity teams have drawn attention.⁴ A relatively small number of concise routine cost reports, supplemented from time to time as occasion may demand by special investigations into other aspects of costs, are likely to meet the requirements of management better than voluminous and detailed statements produced as a matter of routine.

The requirements of different levels of management are of course different, senior management being more concerned with

³ Management Accounting, op. cit., pp. 10, 11 and 15.
⁴ Cf., for example, Diesel Locomotives, op. cit., p. 31.
forecasting, planning for the future and setting targets, and other levels more with day-to-day action. In reporting to the different levels of management, there are advantages in conveying information regarding costs in terms of the units which are most significant for the particular levels concerned. In reports designed for foremen, for example, cost information may be expressed in units of time or materials rather than money.

SIMPLIFICATION, STANDARDISATION AND SPECIALISATION

Very important economies of operation can often be achieved by cutting down the range and variety of articles produced. As has already been said, the scope for taking advantage of these economies will depend in large measure upon the size and nature of the market, and any action that can be taken to enlarge the market and to reduce the variety demanded will help. But within any given market situation it may still be true that opportunities for simplification, standardisation and specialisation are not being fully exploited.

The terms “simplification”, “standardisation” and “specialisation” are often used to mean much the same thing; although distinct, the three concepts are in fact closely related. The following definitions may be quoted:

Simplification is the deliberate reduction of variety of manufacture, whether of component or end-product. Specialisation denotes the concentration of a factory or production unit on a very narrow range of products—the consequence of simplification pressed to the limit. Standardisation, a term often used as an alternative to simplification, is here taken to mean organised agreement upon and definition of performance, quality, composition, dimensions, method of manufacture or testing of a product. For example, if a motor-car manufacturer were to decide to reduce his range of models from, say, ten to three, that would be simplification. The decision to make certain parts of the cars common and interchangeable would be standardisation. The supplier of sparking plugs would probably be making only that one product, and that would be specialisation.¹

The process of simplification will thus necessarily involve greater specialisation in production, in the sense of concentration upon the production of a narrower range of products. It may or may not be associated with the definition and application of standards. But after simplification has been carried out there is often an

¹ The Economist, 29 Dec. 1951, pp. 1593-1594. These definitions are identical in content with those used in Simplification in Industry, op. cit., p. 2.
opportunity for the standardisation of the resultant range. Conversely, when standardisation of products is being considered it may become evident that some degree of simplification is needed.

The advantages which may be derived from reduction in variety have been summarised as follows: ¹

To the producer:
1. Longer runs with fewer changes on the production line.
2. Reduced tooling and set-up time.
3. Possibilities of increased mechanisation and special-purpose plant.
4. Easier training of operatives.
5. Simpler and cheaper inspection.
6. Less capital invested in idle plant, tools and space.
7. Reduction of stocks of materials, components, and end-products.
8. Reduced call on drawing office and design staff for special orders, leaving them free for work on new designs or improvements.
9. Simpler clerical and administrative work.
10. Easier service and maintenance.
11. Concentration of sales and advertising effort on a narrower range.
12. And, hence, increased productivity, leading to reduction in costs and prices and to increased sales.

To the user:
1. Lower price for a given quality or performance.
2. Reduced variety and level of stocks at all distribution points.
3. Readier availability.
4. Improved service and maintenance facilities.

The British productivity team which studied simplification in American industry came to the following conclusions:

As a result of our visit to the United States we are convinced that one of the main reasons for the high productivity and low cost which are characteristics of industry there is the ruthless elimination of unnecessary variety and the resultant concentration of manufacturing resources.

Simplification and standardisation have been developed by some sections of industry and by some individual firms in the United Kingdom. We believe that those who have done most will be the first to assert that much more can and should be done.

No doubt there are a few industries in which the scope for simplification and standardisation is small, but we are satisfied that such are the exceptions rather than the rule. For British industry in general we are convinced that there is great scope for raising productivity and lowering

costs by more general adoption of the policies which have proved so successful in the United States.¹

In a later report the same team stated that subsequent discussions with representatives of British industry had strengthened their conviction that “simplification is one of the main means of raising productivity and lowering cost”.²

The following examples of gains in productivity achieved in various branches of United States and British industry as a result of reduction in variety are quoted from reports of the Anglo-American Council on Productivity.

A prominent manufacturer of radio . . . receiving sets . . . had in pre-war times listed 160 models, some of which were produced in as low a quantity as 2,000 spread over six months, and an order for 50,000 was considered very large. Consequently a constant change of factory and work layout was necessary, with repeated rearrangements in training procedure and inevitable administrative complications. The post-war policy had been to concentrate production on some 15 models, of which five used the same chassis in different cabinets. This made possible the production of a better receiver at the pre-war price level in spite of great increases in material and labour costs. Uninterrupted production runs of 250,000 for a single type were now usual. . . .

At one of the largest plants manufacturing diesel-electric locomotives, we were shown once more the advantages conferred by drastic simplification in design and types. During the years 1939 to 1945 material costs in the plant had increased by 41 per cent. and labour costs by 111 per cent., but savings gained on the production line had balanced the increases and the cost of the finished article had not risen. By 1949 material costs were some 110 per cent. above those of 10 years earlier, while price to the user had risen by less than 25 per cent. The management expressed the conviction that simplification had been a prime factor in keeping down the final selling prices. . . .

In the production of domestic irons [a] company had, before the Second World War, 19 types, some of which were listed merely to have an article competing with a similar type produced by some other maker. In the post-war programme there were four varieties using only two types of sole plate, thermostat and shell. The effect had been to keep the post-war price down to 14 per cent. over the pre-war level, though material costs had doubled and wages rates had risen by two-thirds. As a result total sales had doubled and the length of run of each type had considerably increased. Many operations which previously had been carried out by hand could now be mechanised because of the larger quantities produced. The range of electric fans had been reduced from 250 in 1940 to some 50 in 1948, and it was intended to reduce this number much further. It was estimated that the full effect of the simplification programme would reduce direct labour costs by one-half and indirect labour costs by two-thirds.³

¹ Simplification in Industry, op. cit., p. 11.
³ Simplification in Industry, op. cit., pp. 6-8.
The above examples are taken from the United States. Similar advantages have been obtained in the United Kingdom. The following is a striking example:

One of the largest manufacturers of gas cookers has recently made a drastic simplification of the range of cookers produced, with dramatic effect upon production costs and wages. The range of cookers has been reduced from 33 different types, sizes and finishes to one type only in a single finish, with four hot-plate arrangements as the only variants. Such striking concentration has an important bearing on costs and prices and the company is now able to produce and sell this model 32 per cent. below the price of a cooker of similar size and finish previously manufactured. This has been achieved in spite of a general tendency for prices to harden . . . . At the same time the average earnings of individual workers have risen by as much as 15 per cent. largely through better concentration of effort and reduction of the number of changes of work . . . . The over-all production of cookers has risen by 165 per cent., while the number of employees has risen by less than 32 per cent. 1

According to another report—

. . . where clothing companies in Britain have concentrated on a limited range of designs they have gained in productive output. As a result of simplification, stream-lined production methods and layouts become workable and clearly advantageous. 2

The Executive Committee of the German Federation of Trade Unions considers a drastic reduction in the range of types of goods produced to be the most important measure of rationalisation in Western Germany. 3 In Eastern European countries—for example in the engineering industry in Czechoslovakia 4—standardisation of products appears to have been used to a notable extent to improve the productivity of labour.

In a Dutch report the following examples of potential economies from simplification and standardisation are given. In the Netherlands and some other countries paint is sold by weight. Since the specific gravity of various kinds of paint is different, cans must be produced in a great number of sizes. If agreement could be reached to sell the product by volume, considerable savings could be made in the production as well as the storage of cans. Substantial savings could also be made if the system of measures for ready-made clothes were standardised so that final alterations would no

1 Simplification in British Industry, op. cit., pp. 11 and 12.
longer be required on the present scale. In the public sector savings could be made if the transport companies of various municipalities ordered a standardised type of motor bus and if dustbins were standardised. Great importance attaches also to standardisation in the construction of dwellings. The report stated that the Government was attempting to promote standardisation in all these and other cases.¹

The United States automobile industry affords excellent examples of economies resulting from simplification, standardisation and specialisation. In the European motor industry, too, much progress has been made since before the war, both in simplifying and standardising components and in reducing the variety of models. It has, however, been asked whether the European motor industry is sufficiently specialised in view of the long and growing lead of the United States; and the view has been expressed that—

It seems likely in the long run that Europe will not be able to meet United States competition in the field of large standard cars, nor will she be able easily to compete effectively in her own particular field, that of small and medium-sized cars, if so many types continue to be produced; if, in fact, there is not more specialisation between plants and thus between countries.²

A more recent study has suggested that great economies in production and a big increase in the demand for European motor vehicles might be expected to follow a policy of concentrating production primarily on three types of passenger motors, namely: a really small, cheap popular car; a larger, more rugged vehicle, also simple and economical to run, and capable of tackling primitive roads; and a large, mass-produced car, directly competitive with the standard American car in the Chevrolet or even the Buick category. It is not suggested that three such models should be produced at the expense of sacrificing the whole existing range of European models, but that such a policy could be successful only if a radical reduction were made in the number of other types produced.³

The extent to which advantage can and should be taken of the economies resulting from simplification and standardisation, which make mass production methods possible, varies of course from country to country and from one branch of industry to

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¹ De Productiviteit in Nederland, op. cit., pp. 39-40.
another. These methods are probably least applicable to the circumstances of a country such as Switzerland which, with a small population and poor natural resources, must produce largely for export and must meet the individual requirements of a large number of different export markets. The Swiss engineering industry, for example, has achieved and maintained a reputation second to none, and continues to meet the competition of industries much more favourably situated, by concentrating on high quality rather than on low cost, and by seeking to manufacture products which are preferred by customers because of their particular properties and advantages. In other countries, too, certain firms find continued scope for their policy of seeking out pockets of demand for high-quality goods of a specialised character. The demand for such goods is, however, limited.

Many of the difficulties of taking advantage of the economies of simplification, standardisation and specialisation arise from the fact that consumers want, or are believed to want, variety. This may make it risky to put all one's eggs in one basket. A firm which concentrates on the production of one product or a narrow range of products to the exclusion of all else, and whose equipment is designed for this sole purpose, may purchase technical efficiency at the cost of loss of flexibility and adaptability to changes in tastes or market conditions. A production policy that would give the best results in a perfectly stable and assured market may not give the best results in the conditions of uncertainty actually prevailing.

Much depends upon the nature of the product concerned and on the demand for it. For many goods, especially consumers' goods, there are excellent reasons for demanding wide variety. However, it should be remembered first that, especially in a large national market, specialisation and standardisation in production are not incompatible with the maintenance of a wide variety for consumers, for different undertakings may specialise in the production of different varieties. Secondly, a single undertaking, even without narrowing the range of its end-products, may yet find scope for considerably increased simplification and standardisation of components, equipment and processes. Thirdly, producers might often find it worth while to devote special sales efforts to persuading customers not merely to buy more but also to concentrate their demand on a narrower range of products.¹

¹ Cf. pp. 96-97 below.
Design

Technical problems of design, which vary enormously from one branch of industry to another, are outside the scope of this report, but it goes without saying that designers may make an important contribution to higher productivity. Simplification of design figures among the steps recently taken to increase productivity by firms in a number of industries.

No less important than the purely technical problems of design are the administrative problems of ensuring close co-operation between the sales, design and production departments. It is for the sales department to assess the range of consumers' requirements in the field in which the firm competes or intends to compete; and it is the job of the designers, in close collaboration with the production department, to cover that range with the fewest possible models. Since production difficulties can often be greatly reduced by design which takes account of shop problems from the beginning, it seems desirable, wherever possible, that a production engineer should be attached to the design office in an advisory or liaison capacity.

It is essential to concentrate upon the essentials, and to resist any compromise upon them, but to be ready to sacrifice every element of design which is inessential in order to conform to standards.1

It is also important that design and planning staff should be kept informed of the cost of the various equipment and materials used, so that they may be better able to devise the most economical methods and tool designs.

There may sometimes be scope for closer co-operation with users when products are being designed. Such co-operation may often result in modifications in design which reduce costs and prices. Close co-operation with users is perhaps especially important in designing machine tools, and in some countries it may be that more machine-tool designers should visit user factories and find out at first hand what problems are encountered in running the machines.

Finally, just as in a well-run plant there are target dates for production stages, so there should be target dates for design and pre-production stages.

1 Steel Founding, op. cit., p. 39.
Work Study

Work study, as it has been developed in certain countries, comprises two complementary techniques, namely: (a) method study (the detailed analysis of present or proposed methods of production); and (b) work measurement (the detailed assessment of the work content of a defined task). Both techniques can make important contributions to higher productivity. Method study can lead to improvements in the layout of factories and work- places and in the design of equipment, to a better working environment, simplification of work and reduction in fatigue, and can thus result in better utilisation of materials, equipment and manpower. Work measurement can lead to improved planning and control of production and to more efficient manning of plant; can provide indices of labour performance; and can serve as a basis for control of labour costs and, in appropriate conditions, for systems of payment by results.

The basic procedure of method study has been analysed as follows:

1. select the work to be studied;
2. record all the relevant facts of the present (or proposed) method;
3. examine those facts critically and in ordered sequence;
4. develop the most practical, economic and effective method, having regard to all contingent circumstances;
5. install that method as standard practice; and
6. maintain that standard practice by regular routine checks.

Work measurement follows on from method study. It is obviously a waste of time to measure the work content of a job until one is certain that the method is satisfactory, unless the work content is a major factor in determining the method.

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1 In a recent report on progress in the cotton spinning and doubling industries in the United Kingdom, it is stated that the Cotton Board and the technical colleges have done invaluable service in teaching the application of work study methods; the number of mills using these methods has risen from 84 in 1949 to 141 in 1952 and now represents about 30 per cent. of the total. In one mill work study is reported to have led to an increase of 30 per cent. in productivity in the card room and the ring room, with a decrease of 14 per cent. in carding costs and 10 per cent. in spinning costs. Cf. A.A.C.P.: Cotton Faces the Future (London, 1952). The British clothing industry, too, is making greater use of work study techniques. The Clothing Development Council has organised a work study course, with very successful results, to provide intensive training for works managers and factory managers in the industry. (Cf. A Review of Productivity in the Clothing Industry, op. cit., p. 9.)

It is unfortunate that many people have come to believe that the sole object of Work Measurement is to provide a basis for incentive schemes. It is true that Work Measurement forms the best known basis for financial incentive schemes, but the first objective of Work Measurement is the more efficient manning of plant and the improvement of planning and control. This has become increasingly the practice in the United States.¹

Ways in which work measurement may contribute to more efficient production are indicated in the following passage by a German writer:

The analysis of job content used for the purpose of job evaluation may also lead to improvements in and rationalisation of production. Jobs which are found to require great physical efforts may be simplified or slightly changed so that less effort is required and higher performances attained. Jobs which are found to require a high degree of skill and a great deal of training may in certain conditions be mechanised or simplified so that valuable craftsmanship becomes available for other tasks.²

The basic technique of work measurement is time study.

If the proper procedure for Time Study . . . is followed strictly, few difficulties should arise in its application to repetitive work. Unfortunately a technique is one thing and the way it is applied is another; consequently Time Study has in some instances earned itself a bad name, due entirely to the slipshod and sometimes dishonest manner in which it has been applied. Time Studies cannot be made in a hurry. . . . The keys to satisfactory Time Studies are thoroughness, patience and honesty—thoroughness in taking every contingency into account, patience in carrying out long studies and honesty in the handling of results.³

Time study is limited in the main to repetitive work; other means have to be found for determining the work content of non-repetitive work. These include the techniques of “synthesis from elemental data” and “analytical estimating”. These techniques are described in the British Institute of Management publication from which the above quotations are taken.

¹ Work Study, op. cit., p. 11. Cf. also Internal Combustion Engines, op. cit., p. 10: “The principle of standard work measurement is one of the most important tools of American management. The performance of each worker, whether on piece-work or day work, and whether working alone or in a group, is compared daily with the standard time allowed for the job. Failure to make standard time immediately shows up defective tools, deviation from correct methods, defective material, etc. Some plants divide such causes into three categories: man, machine or material.”


Difficulties in the way of making the best use of work study techniques in industry are partly economic, partly technical and partly psychological.

First, thorough work study may be a somewhat costly matter, and manufacturers may not be convinced that the results will justify the outlay. Another difficulty which is at least partly economic is that in most countries, especially underdeveloped countries, persons with the qualifications necessary for undertaking work study are not available in sufficient numbers. Technical assistance to underdeveloped countries and special training programmes may go some way towards meeting this difficulty.\(^1\)

Secondly, it cannot be claimed that the technical problems encountered in work study, and especially in work measurement, have all been satisfactorily solved.\(^2\) Time study is the most satisfactory method of work measurement, but even time study is by no means a perfectly objective technique for measuring the work content of a job. There are subjective elements in the rating of individual workers and also in the fatigue and other allowances included in the standard time. Two different time study engineers may reach different results on the basis of the observation of identical workers under identical conditions. Results may differ still more if they are based on observations of different workers. It is claimed, however, that suitable training for time study engineers makes it possible to reduce such differences to narrow margins.

For a proper appreciation of the limitations and the usefulness of work measurement, further research, and a widespread comparison and testing of standards arrived at by different engineers and by different procedures are needed. Such research is continuously proceeding, and it is to be expected that, even though perfectly objective techniques for measuring the work content of a job may never be found, further progress will be made in overcoming technical difficulties. Already, provided it is carried out with a proper awareness of its limitations, time study is an exceedingly useful technique and can be expected to become increasingly useful in the future.

Even more important than the economic and technical difficulties in the way of making the best use of work study are the

\(^1\) See pp. 130-132 below.

\(^2\) See, for example, T. A. Ryan: "Fatigue and Effort in Relation to Standards of Performance and Systems of Payment", in International Labour Review, Vol. LXV, No. 1, Jan. 1952, pp. 44-63.
psychological difficulties. These can, however, more appropriately be discussed in the next chapter.

PRICE POLICY AND SALESMANSHIP

It has been said that many of the factors affecting industrial productivity—for example, the amount of capital per worker, the size of plants, the scope for simplification and standardisation, and the degree of utilisation of capacity—are themselves largely influenced by the size and nature of the market. This is not to say, however, that they are wholly determined by market factors. Even in prevailing market conditions there may often be opportunities for increasing productivity by installing additional capital equipment, enlarging the scale of operations, maintaining more regular work schedules, or reducing the variety of products.

More important, perhaps, is the fact that no enterprising establishment is content to accept the size and nature of its market as unalterable. The size of a market depends partly upon the prices at which goods are sold. It is an interesting question how far the high degree of mechanisation and specialisation in United States industry is a consequence and how far it is a cause of the large size of the United States market. The history of the United States automobile industry affords a classic illustration of how, if goods can be placed on the market more cheaply, new sources of demand may be tapped, and of how this in turn may enable production to take place in greater volume, with attendant economies due to greater machine utilisation, longer runs and more effective use of labour. Less study appears to have been given to the question of how specialisation has developed in the United States than to the ways in which it is applied.

The size of the market for a firm or an industry depends not only on price but also on salesmanship; and salesmanship and marketing techniques undoubtedly have a very important part to play in increasing productivity. It is frequently possible to persuade customers not merely to buy more but to concentrate their demand on a narrower range of products. The authors of the report on simplification in industry already cited stress the importance of market surveys in helping producers to reduce variety without sacrificing goodwill. They do not believe that simplification means inadequate choice for the consumer. They point out that greater concentration by a given producer on a narrower range of types need not imply less total variety. Each producer is free
to decide his own selection of products, and the existence of a sufficient demand for a particular article will ensure its supply.

We found no reason to suppose that the consumer in the United States is opposed to the policy of simplification. On the contrary, we believe that the consumer appreciates and expects the advantages of lower cost and greater availability so obtained.\footnote{Simplification in Industry, op. cit., p. 9.}

They found no evidence either for the belief that quantity production lowers quality—rather the reverse.

The report on simplification in British industry refers to the fact that salesmen frequently press for additional lines as a means of expanding sales, with the result that the sales and production departments pull in opposite directions. This genuine difficulty can be solved, the report suggests, only if the integration of sales and production policies becomes more generally a major concern of top management.

The authors of these reports believe that much needless variety is encouraged by inaccurate costing and that more accuracy in this respect, reflected in selling prices, would provide a most powerful stimulus towards eliminating superfluity. They commend the policy, apparently more common in the United States than in the United Kingdom, of discouraging special orders by means of stiff price differentials. Other productivity teams, too, considered that more use might be made of price differentials to attract large orders.\footnote{Cf., for example, Steel Founding, op. cit., p. 39.} Other incentives besides price differentials, such as rapid delivery, efficient servicing and availability of spare parts, may be offered to induce customers to accept standard lines.

The task of persuading customers to abandon irrational preferences for variety and to concentrate their demand upon a standard range of products is of course more difficult for a firm or industry producing largely for export than for firms producing predominantly for home consumption; and it may well be impossible to simplify and standardise production to the same degree in the former case as in the latter. The greater relative importance of production for export in the United Kingdom, Switzerland and many other European countries is undoubtedly one of the reasons why, in many fields, the process of simplification has gone less far than in the United States. While production for export must take account of the varying requirements of different export markets there may, however, still be scope for giving foreign
buyers substantial incentives to accept standard lines, and for salesmanship to persuade them to do so. It is claimed that—

... Education of the consumer to accept a restricted range of products, though a very difficult task, is worth while. It is generally agreed that in many fields there is opportunity for further progress.¹

There may also be scope for increasing productivity by persuading customers, by means of salesmanship and financial incentives, to smooth out seasonal fluctuations in demand which prevent the maximum utilisation of capacity.

¹ *Simplification in British Industry*, op. cit., p. 7. Mr. James Silberman, of the United States Bureau of Labor Statistics, is reported to have said, after visiting 120 French industrial establishments, that "the problem of 'educating the customer' remains to be tackled from the beginning in France. In Europe 'educating the customer' is unknown. In the United States this is done; it is difficult, but the results already obtained justify the efforts needed." (Quoted in *L'Usine nouvelle*, Year 6, No. 46, 16 Nov. 1950, p. 21.)
CHAPTER VI

PERSONNEL POLICY

This chapter discusses various matters concerning labour and its utilisation, including labour-management co-operation, employment policy, selection and placement, vocational training, upgrading and promotion, supervision, work study and work simplification, the servicing of skilled workers, wage policy, hours of work, the number of shifts, working conditions and welfare facilities, industrial safety and health, absenteeism and labour turnover.

The successful application in an undertaking of policies in these matters making for the highest attainable levels of productivity does not depend only upon the "psychological climate"—the general attitude of management and workers. It depends also, and more specifically, upon those who are responsible for personnel administration and personnel relations in the undertaking. In a small shop the individual employer can deal directly with his employees; but with the growing size and complexity of industrial undertakings, personnel services or departments become necessary for dealing with a variety of matters within the framework of the general policy of the management.

In many countries there is an evident need for qualified personnel officers who are equipped by training and experience to advise in the formation of the personnel policy of an undertaking, to secure understanding and application of that policy at all levels of the organisation and to be responsible for the appropriate executive duties arising therefrom. In large-scale undertakings the organisation of a personnel service or department, staffed by full-time employees trained and specialised in personnel matters, merits careful attention.

Specific problems of personnel administration are discussed as they arise in connection with the various matters dealt with in this chapter. Here it will suffice to make one general point. The importance of a clear definition of functions and responsibilities is nowhere greater than in the relations between the personnel service or department and other departments in the undertaking.
The definition of responsibilities, and day-to-day working relations with other departments, should be such as to enable the personnel service or department to exercise fully its responsibilities concerning working conditions, employment procedures, welfare services and other personnel questions.

**Labour-Management Co-operation**

It is generally agreed that efforts to promote higher productivity in an undertaking will make little headway without the co-operation of workers.

Various steps may be taken to elicit such co-operation. The least far-reaching of these steps is that workers and their representatives should be given adequate information about the firm and especially about any changes that the management proposes to introduce, and that the reasons for such changes should be explained. A variety of media of communication are available, including informal personal contacts, meetings, charts, display posters, house magazines, booklets, pamphlets and letters; many companies have found foremen and union representatives to be the most effective means of communication for most purposes, since they can provide the least artificial and the most informal and personal channels.

One-way communication, however, suffers from the disadvantages that information provided is not always understood unless it is discussed and misunderstandings are cleared up, and secondly that the workers are merely informed of what is going on without being given any opportunity to formulate views and comments. There is a growing realisation that channels of communication, if they are to serve their purpose effectively, must carry two-way traffic, orders and explanations going down the ranks while information, grievances and opinions come back by some agreed procedure. Only in this way can the individual worker be made to feel that he counts.

How to get effective two-way communication is a problem that each undertaking must solve in the light of its own particular circumstances. Often no new machinery will need to be

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created. Special machinery for labour-management co-operation is not widespread in the United States, but the various productivity-team reports give the impression that in most branches of United States industry there are effective two-way communications and a good deal of freedom of expression through the unions and through informal personal contacts at all levels. The British Cotton Spinning team, for example, reported that—

The principle is widely accepted that every employee is entitled to know what the firm is doing, why the firm is doing it and how the firm is doing it. . . . Various ways are adopted to meet this requirement. . . . In nearly every mill we visited, however, some definite provision is made for the natural desire of the worker to know what is going on. The management believes that this makes for better work and a greater feeling of responsibility.

Individual workers can be given further opportunities for self-expression and participation by means of suggestion schemes. Schemes under which workers are encouraged to make suggestions and are rewarded for valuable ones are widely applied in United States industries and are coming to be more widely adopted elsewhere. They play an important part, for example, in the current programme for raising productivity in French foundries, and have been adopted in most establishments in the French electrical construction industry, where they are reported to have led in certain cases to very original solutions.

Suggestion schemes are also widespread in Germany and Switzerland. A German writer has suggested the following principles for a successful suggestion scheme: show examples of significant improvements in productivity through better work methods; remember the importance which the worker attaches to his own suggestions and reply immediately after he sends them in; have a joint committee judge the ideas and, when they are found acceptable, fix the reward; hand the reward to the

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worker with some ceremony and give wide publicity to successful suggestions.¹

Where industrial relations are bad, workers may be deterred from putting forward suggestions because they do not wish to be regarded as trying to curry favour with the management, or there may be a poor response as a result of general apathy, or suggestion boxes may become receptacles for more or less trivial grievances. Like other devices for labour-management co-operation, suggestion schemes work well in the right atmosphere and badly in the wrong one. Rewards for suggestions which save considerable sums of money should be substantial and, in the case of suggestions which are rejected, it is important to take the trouble to explain why they cannot be adopted. It is reported that in certain French foundries it has been agreed that small rewards will be paid for any serious suggestions even if they cannot be adopted.

Another form of worker participation to which growing attention has been given in recent years is that workers' representatives may be given the opportunity to participate in the technical processes of time and motion study and rate fixing.²

The kinds of co-operation thus far discussed do not necessarily require the setting up of formal joint machinery. The establishment of such machinery may however be the best way of ensuring regular two-way communications, handling suggestion schemes and developing other forms of co-operation. In many countries there has been in recent years a remarkable growth of special machinery—works committees or councils, joint production committees, labour-management committees, etc.—for consultation and co-operation between workers and management in the undertaking.

The basic purpose of such machinery is to secure full recognition of the importance of the human element in industry, to make workers feel that they count as individuals and to give them a greater interest in the general operation of their undertaking. A second purpose is to promote higher productivity. These two purposes are closely related, since one of the most important factors affecting productivity is the atmosphere in the undertaking. In 1952 the International Labour Conference stated that "... consultation and co-operation on a basis of mutual con-

² See below, pp. 137-139.
idence render an essential contribution to the efficiency and productivity of an undertaking . . . ”.¹

Such machinery provides opportunities for discussion of questions concerning improvements in methods of production, industrial safety and hygiene, welfare facilities, the best utilisation of working time, reduction of absenteeism, economising raw materials, etc. Sometimes, as in Norway and Sweden, committees have been set up for the purpose of associating representatives of the workers with the rationalisation of production and with time and motion studies.

It is too soon to attempt to pass a general judgment on the success of works committees and similar machinery.² Results obtained vary greatly, not so much from country to country as from one undertaking to another.³

In countries where works committees have been set up under compulsory legislation the intentions of the legislators are sometimes defeated by the passive or negative attitude of those directly concerned. It is all very well for the law to prescribe collaboration, but it is obvious that if employers and workers have different views regarding the forms their collaboration should take, or regarding the principle of collaboration itself, any consultative machinery is liable to be largely ineffective.

In France for example it is widely recognised ⁴ that if a number of committees have been less active than they might have been, given the powers conferred upon them by law, the explanation is to be found in certain cases in the attitude of some employers who, having in no way desired the establishment of works committees, have simply submitted to an experiment which they

² In what follows, the term “works committee” is used in a comprehensive sense to describe any joint committee or council whose primary purpose is the promotion of co-operation between employers and workers at the level of the undertaking.
³ For example, of 40 Belgian undertakings which had established works committees (conseils d'entreprise) before it became a legal obligation to do so, 12 indicated, in reply to a questionnaire from the Federation of Belgian Industries, that these had led to higher productivity, 17 that they had led to improvements in morale, 19 that they had led to co-operation in the form of suggestions, and 18 that they had led to improvements in relations between management and workers. See FÉDÉRATION DES INDUSTRIES BELGES: Réalisations sociales dans l'industrie belge (Brussels, 1950), p. 50.
could not avoid. But it must be recognised also that such an attitude would probably have been encountered less frequently among employers if attempts had not sometimes been made by workers to misuse works committees for political purposes. Discussion is doomed to futility or worse when it starts from a basis of fundamental disagreement and lack of confidence.

Though a number of committees have achieved little, and in some cases perhaps nothing, it would however be quite wrong to conclude that the establishment of works committees has been a failure in France. Based on information provided by inspectors of labour, especially in the most highly industrialised areas, the view has been expressed that—

. . . the results obtained are far from negligible and are capable of growth. An optimistic view may, in fact, validly be based on the efficacy already attained by some committees and on the value of what has on the whole been achieved.  

The French Ministry of Labour has found that many committees "which do not fully exercise their legal prerogatives give evidence nevertheless of considerable activity" and that a number of others "are assuming fully and in a satisfactory way the whole of their functions, are proceeding to the study of important technical problems and are thus contributing to the establishment of a spirit of co-operation".

Positive results have thus already been obtained. The fact that legislation is not entirely effective should not obscure the results to which it has contributed. It seems that these positive results have been achieved to the extent that the intentions of the legislators have been faithfully respected by employers and workers, and in cases where works committees have been able to function in the spirit in which they were intended to do so. Their success has, for the most part, depended upon the goodwill of the two parties.

In other countries, too (e.g., Israel where joint productivity committees in firms employing more than 50 workers have been in existence since 1951) it is reported that such committees have had encouraging effects in increasing productivity. In the Scandinavian countries, although individual opinions may vary, it is generally agreed that works committees are an excellent means of ensuring co-operation and improving produc-

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1 "L'activité des comités d'entreprises depuis 1950", in Revue française du travail (Paris), Year 6, Nos. 10-12, Oct.-Dec. 1951, p. 523.
2 Ibid., pp. 521-522.
tion, and that they have achieved definite results. Emphasis is laid upon the obligation of managements to supply information to the works committees concerning the economic and technical problems confronting the undertakings. In Norway and Sweden, in accordance with time study agreements, workers' representatives participate in measures taken to rationalise production.

In the United Kingdom, the annual report for 1952 of the Ministry of Labour and National Service says that, while during the year under review the Ministry continued to encourage the development of joint consultation, few new joint committees were set up, others which had been in existence for some time ceased to function, and a large number were "apparently functioning in a somewhat desultory fashion". In the view of the Ministry, however, this does not indicate any lack of progress, but rather a change in emphasis. Greater attention is now being paid by many firms to less formal methods of consultation through discussion groups, regular management meetings including supervisors, and conferences of the whole staff.

Western Germany and the Netherlands are other countries in which a great deal of attention has been paid recently to the problem of creating and maintaining a good psychological climate in the undertaking. In Germany research is being devoted to what is called the sociology of the plant, with the aim of recasting the relationship between labour and management on the basis of the consciousness that both are members of the same productive community rather than antagonists, or at best partners with their own separate economic interests.

Heyer recommends the following principles in dealing with people in the plant:

Keep yourself under control and never get excited. Give your men opportunities to earn praise and recognition. If criticism is neces-

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1 This was the view of a meeting of Danish, Finnish, Norwegian and Swedish employers, manual workers, and salaried employees held in Stockholm in November 1950. (Cf. Co-operation in Industry, op. cit., pp. 45-52.) See also Föreignämnderna, No. 2, Aug. 1953, pp. 1-13, for a survey, from the trade union point of view, of the activities of works committees in Sweden in 1952, with statistics of the number of committees in existence in various industries, the frequency of meetings, and the number of committees in each industry considered by worker members to have dealt satisfactorily with such matters as the provision of adequate information to workers, suggestion schemes and problems of redundancy.


3 See, for example, Gzik, op. cit.; and Ernst Michel: Sozialgeschichte der industriellen Arbeitswelt, ihrer Krisenformen und Gestaltungsvorsuche (Frankfurt am Main, Josef Knecht, 3rd ed., 1953).
sary, make it tactfully and mention positive achievements, too. Humour makes all situations easier. Listen attentively to your people so as to understand what they really want. Explain the work to be done in such a way that you can be certain that you have been understood. Consider the interests of your men not halfheartedly but as fully as your own.¹

Experience in a number of countries confirms the conclusion that the atmosphere and spirit of industrial relations in the undertaking are more important than any single device, procedure or technique for promoting labour-management co-operation. If there is a basic desire to co-operate, appropriate machinery to give effect to this desire will generally be worked out in response to the needs felt; when the basic feeling is one of mistrust, the most carefully designed machinery for co-operation will have no driving force behind it and may even create new points of friction. Because a particular procedure or piece of machinery works well in one undertaking, that is no reason for assuming that it will give good results if reproduced in another, where the basic conditions for its success may be lacking. As one employer has written—

The first condition of success concerns the attitude of the higher Management.

Unless Management is imbued with respect for its people as human beings and with a genuine desire to carry them with it, institutions and procedures will prove sterile.

Facilities for consultation should be approached not as concessions but as opportunities—opportunities to get at what their people are thinking and to put over the problems and point of view of Management. If the spirit is right the rest is a matter of organisation and procedure.²

It is, however, not only on the part of management that the right spirit is important. This spirit will be lacking unless workers who participate in joint machinery combine a strong sense of responsibility towards those whom they represent with a regard for the well-being of the establishment in which they work.

To say that a spirit of co-operation is more important than methods and procedures is not, however, to say that vague feelings of goodwill are all that is needed; for a spirit of co-operation that does not find expression in practical action is not likely to endure.

Even where there is a sincere desire on the part of employers and workers to collaborate through works committees, and where

² C. G. Renold: Joint Consultation over Thirty Years. A Case Study (London, Allen and Unwin, 1950), p. 120.
such committees have been set up as a result of voluntary agreements or in conformity with legal requirements willingly and fully accepted, the work of such committees raises a number of problems, and care should be taken to avoid certain mistakes. Points that need to be borne in mind include the following:

(1) Trade union organisations have in the past often been opposed to the establishment of works committees, fearing that these, while not independent of the employer, would nevertheless compete with the trade union for the allegiance of the workers. It is therefore important to establish a clear understanding regarding the respective fields of action of the works committee on the one hand and the trade union on the other, and to secure the support of the trade union for the works committee, so that the trade union does not feel that an attempt is being made to bypass it.

(2) It is equally important that a works committee should have the support of the workers and other staff in the undertaking itself. Workers often show some indifference towards these committees; often, for example, many workers do not take the trouble to participate in the election of members of the committees. There may be various reasons for this lack of interest: many workers, not having understood clearly the role and function of the works committee, may have conceived exaggerated hopes at the time of its establishment and may quickly lose interest in an organ which does not appear to them to have achieved any definite improvement in wages or working conditions; works committees often encounter considerable difficulties in keeping the personnel informed about their work; or again, if regulations provide that trade unions shall have not merely the right to present candidates for election to the committees but a monopoly of this right, it may happen that non-union personnel take little interest in them. These difficulties can be met in part by giving the works committee a real job to do, and by taking trouble to ensure that all personnel have as clear an understanding as possible of what this job is, and are kept as fully acquainted as possible with what the works committee is doing. One way of maintaining interest in a works committee is to have a "public gallery" to which a limited number of non-members are invited, though they do not take part in the discussion. This can also serve as a useful training for potential members of the committee by giving them an insight into the procedure and conduct of meetings.
(3) Both employers and workers may lack experience in the techniques of joint consultation. Furthermore, workers’ representatives may be so lacking in knowledge and understanding of production problems as to make joint consultation and discussions largely futile. These difficulties are perhaps likely to be especially serious in underdeveloped countries. Both difficulties may be met, in part at least, by appropriate training. The latter difficulty will also call for frankness on the part of management in explaining what its problems are and providing enough information to enable workers’ representatives to form realistic views about them. In the United Kingdom in 1949 there were complaints that consultation was not fully effective in the nationalised industries, but was sometimes merely a name given to a channel of information and instructions from the management. The Trades Union Congress decided to press for more training for employers and employees in joint consultation, the Ministry of Labour conducted propaganda on the subject, and the British Institute of Management supplied workers’ representatives with information on production subjects.

In general, trade unions have been quick to realise the importance of training worker delegates, and have sponsored a variety of measures to this end—including the publication of special reviews and pamphlets, and the organisation of courses, conferences and study groups for delegates. In France it is reported that—

The necessity for this action on the part of workers’ organisations has in some cases been so well understood that collective agreements take account of it. They provide that the time devoted to courses or study groups organised by the trade unions or local federations shall be considered as time devoted to the exercise of the functions of a member of the works committee and shall be remunerated in the same way. Such courses are organised once a month; those concerned are free to attend them during working hours; on their return they present a statement from the trade union organisation certifying that they have in fact participated in the training organised for them. Such agreements have been in force for several years, especially in the textile industry at Roubaix and Tourcoing, and for bank employees at Lille. Their application gives rise to no difficulty.1

The Norwegian Federation of Trade Unions decided in 1952 to launch a training programme with a view to making clear the aims of the trade union movement, explaining the reasons why it supports efforts to raise productivity, and qualifying members

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1 "L'expérience des comités d'entreprises", op. cit., p. 103.
for more effective participation in the work of production committees. T.W.I. (Training Within Industry) methods were used, and eleven specially trained instructors have for over nine months devoted all their time to conducting courses for shop stewards and production committee members. In practically every country, however, much remains to be done by way of training worker members of works committees, and efforts to this end need to be pursued vigorously. One difficulty is that regulations sometimes provide for unduly frequent elections and the same delegates are not always re-elected.

(4) It is important to give special attention to the position of foremen and supervisors. If the approach comes from top management to the rank and file of the workers, and meetings are in effect meetings between top management on the one hand and union representatives, shop stewards or other leaders of the rank and file on the other, those who are in immediate charge of the men and women represented on the committee may feel themselves by-passed. They may find works committee members going over their heads to the higher management and may even learn of management decisions from men working under them before the information has reached them officially.

How these difficulties are to be met must depend upon the nature and structure of each individual undertaking. Adequate representation for the foremen and superintendent grades on the works committee is important. Regularising the procedures for consultation will help.¹ If the rights and privileges of worker members of the committee are defined by agreement, and comings and goings and consultations are confined to certain known individuals, occasions, places and methods, foremen and superintendents know better where they stand, and their duties as regards discipline are clarified. If meetings are reduced to regular scheduled occasions and are only handled on prepared agendas, surprise and emergencies are eliminated and time is given for prior consultation with foremen and other grades of management concerned. Rules may provide that the first approach to management on a question concerning a particular department should be to the superintendent of that department. If, on a question concerning more than one department, or the undertaking as a whole, the entire body of foremen or superintendents are too numerous to be consulted in advance by management, a reorganisation of the

¹ Cf. Renold, op. cit., p. 102.
chain of authority may help—for example, a grouping of superintendents under a limited number of senior superintendents who can be consulted and who can in turn keep the superintendents reporting to them fully aware of what is going on.

(5) Since negotiations regarding wages, hours and conditions of work are normally the responsibility of the trade union and not of the works committee, some difficulty may be encountered in giving a works committee a sense that it has an important job to do and a real contribution to make. Again frankness on the part of management in providing information, and a willingness to give the works committee real problems to handle, seem to be the answer to this difficulty. In a British firm with a good record of labour-management co-operation over 30 years it is stated that—

At an early stage the production programme for the forthcoming four weeks was laid before the Joint Meeting, with a statement of its effect on employment; where relevant to the programme, some information about market prospects would be added. The performance in comparison with the past programme was given, and causes for discrepancies explained and discussed. Information about new processes or departmental reorganisation was given with particular reference to the effect on numbers and classes of workers. The introduction of new machines was notified well in advance so that any repercussions, such as the grade of operator to be employed, could be considered. General developments such as structural changes in the main organisation, the undertaking of new kinds of work, the acquisition of new establishments, were also notified, with full explanations. Information was given on the creation of new posts and on appointments and promotions in management grades. . . . No information having a direct bearing on the daily life of the establishment was withheld.1

The author adds that—

The management has no doubt about the beneficial effects of imparting this kind of information, but the real nature of the benefit may not be obvious. It does not lie so much in the creation of an active interest or positive co-operation on the part of the worker as in a general sense of confidence and stability. This seems to arise from the fact that everyone knows where he stands and what his rights and obligations are, coupled with the confidence that no changes will be sprung on him unawares. Changes are, of course, the inevitable accompaniment of progress but, however good in itself an innovation may be, it is always disturbing to the people affected. But give those people warning in advance—long enough in advance to permit discussion in a calm atmosphere—and the change, if sound, will be accepted. . . . The golden rule for successful joint consultation is to get a question on to the table whilst the situation is still fluid and before positions have been taken up.2

1 Renold, op. cit., p. 116.
2 Ibid., pp. 116-117.
(6) Works committees can be prevented from becoming mere channels for the ventilation of more or less petty grievances if other machinery is provided for dealing with these quickly and effectively. Ease of access to the employment or personnel department is important in this connection.

Whatever the difficulties encountered, there can be no doubt that in many countries more consultation and co-operation, formal or informal, between managements and workers in industry, and more scope for genuine participation by workers in programmes to raise productivity, are required if all that can be done to raise productivity is to be done. What Hutton has said of the United Kingdom is also true of many other countries.

... The reforms, improvements, and changes needed—in principles and practices, in manners and methods, in activities and attitudes—are far-going. They represent a break with the accumulated rigidities and encumbrances of many decades. For this reason they are unlikely to be applied on the scale needed unless they are both devised and applied co-operatively by both sides of industry.¹

Experience of human nature suggests, and a number of studies have confirmed, that to present people with the facts, to lecture, persuade and cajole, is much less effective as a way of changing human attitudes and behaviour than to put people in a situation where they are called upon to make a group decision and to accept responsibility for it.

**Employment Policy**

If workers are to co-operate in measures to raise productivity it is essential that they should have confidence that everything possible is being done to prevent technological improvements from giving rise to unemployment. Action to this end is therefore one of the most important matters for labour-management consultation at the level of the plant as well as at higher levels. The action to be taken will normally be a matter for discussion with trade unions, though the problems involved may also be considered by works committees.

In Chapter II a distinction was drawn between (a) measures to maintain a high general level of employment, (b) measures to reduce displacement of labour and to assist the re-employment of unemployed workers, and (c) measures to protect the living standards of unemployed workers.

¹ Hutton, op. cit., p. 181.
Action to maintain a high general level of employment is primarily a responsibility of governments. So, for the most part, are measures (such as unemployment insurance or assistance) to protect the living standards of workers unemployed between jobs; but the granting of severance pay by individual firms may make an important contribution to this end, and in some industries funds have been set up for the relief of workers who lose their jobs as a result of technological improvements. This has been done, for example, in certain branches of the United Kingdom steel industry, and has been recommended at a meeting convened by the French Trade Union Productivity Centre.

It is, however, through measures to reduce the displacement of labour and to assist the re-employment of unemployed workers that the managements of individual undertakings can make their most important contribution to the task of reconciling higher productivity with the maintenance of economic security for workers.

The problem of maintaining the level of employment in an undertaking in which an increase in labour productivity has made it possible to produce the same output with a smaller labour force is not merely a matter of personnel policy. It calls for united efforts on the part of all or most departments in the undertaking. If employment is to be maintained, sales must be expanded and the sales department, therefore, has an important role to play. Besides more vigorous sales efforts, price reductions may be necessary, and the design, production and other departments may be called upon to make special efforts to reduce costs.

Because combined efforts by a number of departments are necessary, it is important that top management should provide leadership and direction and should ensure that this problem receives attention commensurate with its importance. In three United States companies well known for providing steady work—

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2 CENTRE INTERSYNDICAL D'ÉTUDES ET DE RECHERCHES DE PRODUCTIVITÉ: Productivité mais... plein emploi et niveau de vie (Paris, undated), p. 168. The conclusions reached at this meeting are summarised in Industry and Labour, Vol. IX, Nos. 11-12, 1 and 15 June 1953, pp. 351-352.

the Proctor and Gamble Company, the Nunn-Bush Shoe Company and Geo. A. Hormel and Co.—the programme for stabilising employment was sponsored with evangelistic zeal by the top man. "Real progress in stabilization can be made only if management attacks this problem with the same determination and ingenuity which it applies to other problems of the business." 1

It is desirable, however, that some officer with a narrower range of preoccupations than top management should be responsible, under top management, for leading a company's programme for maintaining employment; and it will, in many undertakings, be the personnel manager who is best fitted to do this. He will be personally involved in any unavoidable layoff of workers and will often be more conscious than any other management official of the need for measures to stabilise employment.

He can point out to his colleagues the magnitude of the problem, keep them informed of how other companies have met it, arrange meetings of departmental heads at which problems can be discussed, and in general strive for the maximum co-operation between all departments in developing a satisfactory programme.

One important matter in which he may need the co-operation of the production and other departments concerns the period of notice that can be given to workers and their representatives in advance of expected displacements of labour. The problem of absorbing displaced workers can often be greatly eased if such notification can be given some time in advance. This will be possible only if the changes resulting in the displacement of labour are themselves planned adequately in advance. Erratic movements in demand may be difficult to foresee and provide against, but changes in production techniques and equipment normally have to be planned well in advance. A long period of notice enables the workers affected to make plans for their future; it enables the union to gauge the effect of the new process or machines on its members, in terms not only of employment but of workload, earnings, security adjustments, physical conditions of work and the like; and it also enables the government agencies concerned, particularly the employment service, to take action to counteract individual unemployment.

Another matter which calls for co-operation between a number of departments is the timing and speed of changes. If a series of

labour-saving innovations can be introduced over a period of time instead of being bunched closely together, their effects on employ­
ment are likely to be much more easily absorbed. Normal labour
turnover, and any expansion that may be taking place either in
the economy as a whole or in other departments of the firm, will
both ease the problem of maintaining employment.

The level of employment in an undertaking after the installa­
tion of technological improvements will depend chiefly on outside
circumstances and the action of departments other than the per­
sonnel department. But even if there has to be a reduction in the
numbers employed in some departments, or in an undertaking as
a whole, this will not always mean that workers need be laid off;
and it will be the responsibility of the personnel department to
ensure that only in the very last resort are workers laid off as a
result of measures taken to raise productivity.

The scope for reabsorption of displaced workers within the
undertaking can be increased, in the first place, by suspending or
slowing down normal recruiting some time in advance of the intro­
duction of a change that is going to displace a number of workers.
It can be increased, secondly, by taking full advantage of existing
or potential opportunities for transferring workers from one depart­
ment to another.

Experience has shown that, if a program of transfer is to be success­
ful, the following conditions must be met:

(1) Employees must be versatile in the sense that they either have
skills to perform several different jobs or have the ability to learn those
skills easily.

(2) A study should be made of the jobs in the factory to determine
which ones are similar enough to make transfer of employees feasible.

(3) Employees must be willing to accept transfer and must co­
operate in learning the new work.

(4) There must be a satisfactory training program for each job.

(5) Seniority provisions in union contracts have to be flexible enough
to permit transfer from one job to another and from one department to
another.

(6) A policy regarding pay for transferred employees must be
worked out and accepted by the employees.

In spite of the difficulties to be overcome in working out a program
of transfer, the efforts of many companies have been successful.¹

In some cases employers can go further and give a guarantee
that no workers will be dismissed as a result of particular measures

¹ Gibbons, op. cit., pp. 7-8.
taken to raise productivity. Whether such a guarantee is possible will depend largely upon circumstances outside the control of employers—the nature and size of their market, the availability of raw materials, the rate of labour turnover, etc.—but it will depend also partly upon such factors as the vigour of managements' sales efforts, how far managements plan ahead, and what steps are taken to suspend normal recruiting, to arrange transfers and to provide training and retraining facilities. Wherever such a guarantee can be given, it will evidently be a factor of the greatest importance in influencing the attitudes of workers towards a drive for higher productivity.

Finally, if despite all efforts a certain number of workers have to be dismissed, management may do its best to find alternative employment for them, preferably in the same area. This will be especially important in countries and areas in which a recognised employment service is not highly developed or fully utilised.

The importance of careful study and planning of the best methods of dealing with the problems of redundancy, and of communicating to the workers the results of such studies and the plans proposed, was emphasised at a meeting convened by the French Trade Union Productivity Centre in May 1952.

Besides the measures thus far discussed there are a number that must in general be regarded as inferior substitutes for other means of dealing with the problem of technological unemployment. They may, however, sometimes serve a useful purpose in special cases or as provisional or emergency measures.

They include, first, short-time work and work-sharing. While a reduction in the length of the normal working week, as has already been suggested, may constitute—in suitable circumstances and within limits—a reasonable and satisfactory way of absorbing the

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1 Such a guarantee was given by French foundries participating in the experiment described on p. 130 below. Undertakings participating in a somewhat similar experiment in the French men's clothing industry have given a guarantee that no staff will be dismissed as a result of increased productivity for an initial trial period of 12 months.

2 Cf. Heyer, op. cit., p. 30: "The assurance that nobody will be dismissed as a result of the scheme is of particular importance. Right from the beginning it must be made clear what is going to happen to those who may become redundant. In no case should they stay in their reorganised department. When looking for new occupations for these men we should first think of tasks and problems which were being held in abeyance."

3 This has, for example, been recommended by the President of the National Council of French Employers; see Georges Villiers: "Les exigences de la productivité", in Bulletin du C.N.P.F. (Paris), Year 6, No. 87, 5 Nov. 1952, p. 2.

4 Productivité mais..., op. cit., p. 168.
effects on employment of technological gains, erratic short-time working and work-sharing are unsatisfactory for employers and still more so for workers. They may, however, be preferable to the dismissal of a part of the labour force, if opportunities for regular employment are expected shortly to revive.

Secondly, employers may be required, either by law or under collective agreements, to retain in their employment, for a time at least, workers whom they would otherwise have dismissed; or they may do this voluntarily. As has already been suggested, it is of the utmost importance that employers should do all in their power—by planning ahead, suspending normal recruiting, etc.—to find other jobs for displaced workers, and that when there are reasonable prospects that all displaced workers can be usefully absorbed a guarantee should be given that no workers will be dismissed as a result of specific measures to raise productivity. But action to avoid redundancy is one thing; to retain on the payroll workers who are in fact redundant is another. In Italy the freedom of employers to dismiss workers was limited during the years immediately after the war by a system of blocking dismissals, which was brought into force as an emergency measure in February 1945. This system is, however, no longer effectually in force. In the United States and other countries clauses prohibiting the dismissal of permanent or regular employees as a result of mechanisation are to be found in collective agreements in some industries.  

Since, however, the entire benefit to society of a technological improvement may lie precisely in the fact that it enables a given volume of production to be achieved with less labour and by fewer workers, a prohibition on dismissals may make the change not worth introducing, and a provision of this kind may amount in effect to a veto on technological progress. Moreover, the effect on the morale of the whole labour force of the retention in employment of workers who know they are not needed and yet cannot be dismissed may be very harmful.  

If other steps are taken to look after the interests of displaced workers, it is doubtful whether employers can reasonably be asked to agree to arrangements of this kind.

Thirdly—a matter which relates rather to the prevention of hardship than to the prevention of unemployment—it is sometimes contended that special provision should be made by industry

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1 See, for example, United States Department of Labor: Collective Bargaining Provisions..., op. cit., p. 48.
2 Cf. Jacoboni, op. cit., p. 103.
for supplementing the earnings of displaced workers who have had to accept lower-paid jobs as an alternative to unemployment. On British Railways, for example, arrangements exist for the reabsorption of employees made redundant by schemes for raising efficiency, and they continue to receive their former wages for up to a year if they have had to accept work in a lower grade. Compensation schemes have also been introduced with some success by progressive engineering firms. For a limited time, especially if there are reasonable prospects that the workers concerned may in their new jobs rise quickly to grades not inferior to those from which they were displaced, there is a good deal to be said for this. The anomaly of paying different rates for the same job may, however, give rise to difficulties; and the longer such special subventions are continued the more difficult it becomes, from the point of view of society as a whole, to justify the continuing additional cost of production they entail.

Selection and Placement

If an employee is to do his best work and to receive the fullest satisfaction from his job, it is clearly important that he should be employed on work for which he is physically and psychologically suited, and that he should "fit in" with the group with which he works. Trouble taken in the selection and placement of personnel at all levels, and more especially at the higher levels, is likely to be well worth while.

Vocational guidance or employment counselling approaches this problem from the point of view of the individual, and asks what jobs he is best suited for. The Recommendation concerning vocational guidance (No. 87) adopted by the International Labour Conference in 1949 sets forth a number of principles regarding the organisation of vocational guidance services. While the responsibility for organising such services rests primarily with public authorities, representative organisations of employers and workers can make an important contribution to their successful functioning. The Netherlands and the United Kingdom are among the countries at present devoting special attention to the problem of extending and improving vocational guidance services.

1 See "Workers' Attitude to Productivity", op. cit., p. 11.
Improved techniques for the selection and placement of personnel approach the same problem from the point of view of the job, the aim being to find persons suited to its requirements. Such techniques may not only save employers money by helping to avoid placing persons in work for which they are not suited but may also supplement vocational guidance services in discovering aptitudes and talents in individuals which might otherwise have remained unrecognised.

The technique of the planned interview, designed both to assess an applicant's capacities and to give him a satisfactory introduction to the firm, has already proved its worth and is being more widely adopted in industry in many countries, though, especially among smaller firms, it would seem that its importance is still insufficiently appreciated. It is a common practice for the initial interview always to be carried out by the personnel department in firms where there is one.

More controversial and less widely adopted is the practice of testing personnel for mechanical aptitudes and emotional characteristics. This, too, is being done on a growing scale and with excellent results in some cases, but it is still regarded with scepticism in certain quarters. Certainly a great deal remains to be learned about the most appropriate kinds of test and the conclusions that can legitimately be drawn from the results.

On the whole, it can be said that management is increasingly receptive to the use of improved techniques for selection and placement. Difficulties encountered on the part of management appear to arise largely from lack of suitably qualified personnel and lack of facilities for applying tests. These difficulties are naturally greatest in small firms. Advisory services and training facilities placed at the disposal of industry by public authorities or national institutes can go a long way towards overcoming them. It is understood that in a number of industries in the United

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1 It is reported, for example, that in the selection of supervisors in the United States "wide use is made of psychological tests, particularly for mental ability and aptitude, other tests being still largely in the experimental stage". (A.A.C.P.: Training of Supervisors (London, 1951), p. 1.) In the same report it is recommended that in the United Kingdom "the use of intelligence and other tests as aids in the selection process should be developed experimentally, provided that the administration and interpretation of these tests is in the hands of qualified persons and takes account of the results of further research" (p. 36). A South African rubber factory has introduced a system of aptitude testing for Africans who apply for jobs, and it is found that those who pass the tests can as a rule be relied upon to produce a satisfactory output.
States frequent use is made of the assistance offered by the state labour service in applying to prospective employees tests devised by the Occupation Analysis and Industrial Service Division of the United States Employment Service. In the United Kingdom the National Institute of Industrial Psychology has organised one-week courses in different parts of the country for training in interviewing and testing procedures.

The attitude of trade unions and workers generally towards improved techniques for selection and placement appears to be distinctly less favourable than that of management. A number of difficulties and objections are encountered on the trade union side.

Thus it is very usual and natural for firms to give a preference in taking on new workers to applicants sponsored by existing employees, and to workers who have formerly been in the service of the firm. This is likely to strengthen the ties between the workers and the firm, but may be difficult to combine with a policy of selecting new workers on the results of interviews and tests. An attempt to substitute scientific selection techniques for less formal procedures adopted in the past may encounter resistance from workers who feel that they are threatened with the loss of traditional prerogatives. Again, attempts to adopt scientific placement techniques may come up against seniority rules or informal traditional procedures regarding upgrading and lay-offs, by which workers set great store. The very term "scientific", used in connection with selection and placement techniques, suggests to many workers an inhuman and mechanical approach to what is essentially a human problem.

Difficulties arising out of the attitudes of trade unions and workers are more likely to be overcome if management understands the reasons for these attitudes and can demonstrate that its approach to these problems is not a mechanical one, and if workers are given full explanations of what management is trying to do. Management and workers have a common interest in reducing the number of square pegs in round holes. It is precisely because human beings are not machines that it is worth taking trouble to find out what kind of work they can do best. If the problems are approached in this spirit, and if it is known that management makes every effort to find suitable jobs for former

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1 For example, the hosiery and knitwear industry. See A.A.C.P.: Hosiery and Knitwear (London, 1951), p. 42.
employees and for applicants sponsored by known and trusted workers, management can go a long way towards meeting the objections which workers sometimes have to the adoption of improved techniques of selection and placement. On the other hand, any mistrust workers may have for such techniques will be strengthened if they are used only for the selection and placement of workers and not in the filling of managerial posts. Nepotism in managerial appointments may sometimes be an important cause of inefficiency and low productivity.

**Vocational Training**

The importance of vocational training as a means of promoting higher productivity has long been recognised. It received a new emphasis in many countries during the war and early post-war years when shortages of labour and conversion and reconversion programmes necessitated the use of inexperienced labour on a large scale. The harmful effects on productivity of inadequate training may not be limited to reducing the quantity and impairing the quality of the output of the individual worker. For it is a characteristic of modern industry, with its growing specialisation of functions, that there is an increasing need for coordinating and integrating the work of the individual with that of the group or team; it follows that one poorly trained individual can impair the productivity of a whole group.

A highly productive economy is a dynamic economy; it responds rapidly and efficiently to changes in demand and in conditions of supply, and promptly incorporates new and improved techniques of production. It follows that emphasis needs to be placed in vocational training on adaptability and versatility. Systems of basic training should not be unduly specialised; they should aim at imparting general information and cultivating general interests and abilities of value in a variety of actual working conditions; and they should be supplemented and completed by other types of training designed to develop specialised skills and to facilitate the promotion of workers to positions of greater responsibility and, when necessary, their adaptation to the changing needs of industry.

Vocational training requirements for industry include training for higher management; training of scientists, engineers and technicians; training of supervisors; training for skilled workers; training for operatives; and induction courses for all categories of new employees. Apart from normal training requirements for all
these categories of persons there may also be a need for special training for selected persons in techniques for raising productivity. It will be convenient to take up each of these matters separately.

Training for Higher Management

“American experience has shown that productivity and education for management are closely related.”¹ The British productivity team that made this statement “was deeply impressed by the steps taken by American business to educate, train and develop its future business leaders . . . ”.²

Problems of management training that require action outside the individual undertakings have been discussed in an earlier chapter. There is general agreement, however, that skill in management cannot be taught by theoretical studies alone and that management training programmes in industry are also needed. “Whatever provision is made for the education of the recruit before he enters business, the larger part of his training for executive responsibility takes place within business itself.”³ While there is still some scepticism of the value both of formal education before entering business and of planned schemes for developing managerial ability in business, there has recently been a marked tendency in the United States to adopt carefully prepared programmes for executive development. The lead has been taken by large corporations, but enthusiasm for this procedure is also widespread among medium-sized and smaller companies. Methods used include visits to other companies, the organisation of technical meetings and management conferences, distribution of reading lists and management bulletins, group meetings, job rotation, attendance at advanced management courses at universities, committee assignments, and even multiple management plans (the appointment of junior boards which are given responsibility for handling certain problems).⁴

¹ *Education for Management*, op. cit., p. 20.
² Ibid., p. 18.
³ Ibid., p. 16.
Programmes for the training and development of executives should be based upon an assessment of future requirements. Some United States companies use a method which has been described as "personnel inventory control". Members of the staff are classified into those promotable immediately, others who are likely to be ready for promotion after more experience or specific training, and yet others who are unlikely to be promotable at all; and a time schedule of replacements required is set up with detailed specifications of technical skills, personal qualities and experience necessary. It is claimed that such information makes it possible to plan a company's true training requirements far more accurately than in the past and to organise facilities accordingly. On the other hand, the schematisation involved has certain dangers.

The system assumes that it is possible to draft a scheme of functions more or less independently of the persons who must "fill" them. A second assumption is that the executive can be conceived as being a complex of properties which one has simply to compare with the requirements of the job. . . . But in doing this one is apt to overlook the subtle relations existing at the top of any organisation where, moreover, the functions are more often adjusted to the available persons and their characteristics than the other way round.¹

In most countries there is room for further study of the problem of executive training. This is one of the questions that is engaging the attention of the Organisation for European Economic Co-operation. In India efforts are being made by the Central Ministries of Commerce and Education to establish an Administrative Staff College and a National Institute of Management. A Planning Committee composed of leading industrialists and educationalists has been set up for the purpose. An Institute of Management has already been established in Bangalore and consideration is being given to the establishment of an international Institute of Management for Asia and the Far East.

Where it is considered desirable to employ a larger number of trained men, and especially of university graduates, in industry, problems frequently arise regarding the level at which they are to be taken into employment and their relations with non-graduate employees who look for promotion from the ranks and who may feel that a policy of employing university graduates blocks their chances. It is reported that in the United States—

Management, the employee and the business schools accept the principle that students, whatever their degrees, have to start at the

¹ *Wie volgt ons op?*, op. cit., pp. 22 ff.
bottom when they enter industry and are in competition with recruits without university training but with years of practical experience.¹

Yet, while many American graduates start by being trained as foremen or lower on the production side, they do not in the ordinary way remain in such positions. Their promotion is commonly more rapid than that of others and "it is now generally held that promotion beyond the foreman level is increasingly difficult for men who have not acquired a college education \ldots\".²

There is no easy solution to the problem of reconciling the growing need for highly trained men in industry with the need for keeping open the avenues of promotion from the ranks. Much can be done to meet this difficulty, however, by increasing the opportunities and facilities for part-time training for industrial employees so as to enable men with practical experience to acquire theoretical knowledge and technical skills. In this connection, too, it is important to cultivate close relations between industry and the universities.

Training of Scientists, Engineers and Technicians

This subject also has been discussed in an earlier chapter. While basic training in science and engineering must be provided in universities and technical colleges, a good deal can be done in individual undertakings by means of special training programmes to bring knowledge of techniques for raising productivity to those who can use them—and this includes trade union officials and workers' representatives as well as management officials. Some examples are given below of special training programmes of this kind.³ It is also important that firms should be willing to make satisfactory arrangements for taking in trainees (for example, in engineering or work study) and for enabling them to acquire, as part of their training, a knowledge of actual working conditions.

Training of Supervisors ⁴

There is no doubt that good supervision is a key factor in bringing about higher productivity, and that the training of super-

¹ _Education for Management_, op. cit., p. 15.
² _Universities and Industry_, op. cit., p. 17.
³ See pp. 130-132 below.
visors can play an important part in improving the quality of supervision. It appears that more attention is devoted to the training of supervisors in the United States than in most other countries. A British productivity team found that, in the United States, industry treats the selection and training of supervisors as a matter of high policy affecting all members of management, from company president downwards; that "... the range and thoroughness of supervisor training in the U.S. surpass corresponding activity in Britain"; and that "... in spite of their keen cost-consciousness all the large companies we visited were spending substantial sums of money on supervisor training and obviously believed strongly in its beneficial effect on productive efficiency".  

The duties of supervisors usually fall into three groups—technical duties, administrative duties and human relations. Many experts believe that primary importance should be accorded to training in human relations. This, it is stated, predominates in United States supervisor training schemes, the approach being always practical. Work study, communications (including effective speech and report writing), costing and budgetary control, and conference leadership, are other subjects commonly found in training programmes.

Difficulties encountered in improving the training of supervisors include the problem of finding the necessary time, funds and personnel, as well as lack of knowledge of the best way to organise such training. These difficulties are the greater if supervisor training is regarded (as it should be) not as a job to be accomplished once and for all, but rather as a continuing process. An outstanding feature of supervisor training programmes in United States industry is their continuous and progressive character based on weekly or monthly sessions in working hours. The difficulties are likely to be greatest for small firms. With a view to meeting them, it seems desirable to set up central bodies responsible for promoting in each industry those methods of supervisor training that are considered most effective. It seems desirable also to strengthen contacts between industry and outside educational and professional institutions, which should be in a position to provide full-time and part-time courses and advisory services, thus facilitating a considerable expansion in supervisor training.

1 Training of Supervisors, op. cit., pp. 1-2.
Training for Skilled Workers

One of the methods most usually adopted for the training of skilled workers is apprenticeship. Practical difficulties sometimes encountered in attempts to improve the quality of training provided for skilled workers and to ensure that a sufficient number are trained include the following:

(1) An individual employer, and especially a small employer, has not always a sufficiently wide range of work and equipment to give apprentices an all-round training and practice in every aspect of their craft. This difficulty can sometimes be met by arranging for apprentices to be indentured not to an individual employer but to a group of employers, serving part of their time with each in turn. The practice, common in the United States, particularly in the building industry, of indenturing an apprentice to the local joint apprenticeship committee has been favourably commented on by a British productivity team. Besides being used to ensure that the apprentice receives a properly balanced training, this practice strengthens the control exercised by the apprenticeship committee over conditions of apprenticeship.

(2) Even if they undertake the necessary range of work and possess the necessary equipment, in the absence of appropriate regulations employers do not always take the trouble to ensure that apprentices actually receive an all-round training. Indeed, cases have come to light in which employers have tended to regard apprentices as cheap labour, keeping them on a fairly narrow range of production operations instead of providing them with diverse experience. The remedy for this difficulty is to be sought through adequate regulation and supervision of apprenticeship conditions. The difficulty will not arise where the content of apprenticeship training courses is laid down and the number of hours to be spent by the apprentice in various departments and on various processes is prescribed. This is often done by apprenticeship committees on which both employers and workers are represented. Adequate machinery for inspection and enforcement should be provided.

(3) Apprenticeship training nearly always includes both theoretical instruction (commonly given in technical colleges or trade schools) and actual workshop training; but the theoretical and the practical elements in training are sometimes not suffi-

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ciently co-ordinated. Indeed, attendance of classes at technical colleges appears sometimes to be regarded by apprentices as a mere formality, having little relevance to their practical training. It may be that in a number of countries the quality of instruction provided in the classrooms has suffered since the war as a result of the shortage of skilled and qualified men and of the fact that salaries offered at technical colleges and trade schools may compare unfavourably with what a good man can earn in industry. When this is the case it may be desirable to take steps to improve the salaries of classroom instructors. For the rest, the remedy appears to lie in a strengthening of the contacts between industry on the one hand, and the technical colleges and trade schools on the other. The British team which studied the training of operatives in the United States reported that—

It was evident in every state visited that most vocational and technical schools have a much more effective liaison with local industries than is usual in Britain. The active interest of industry seems to be promoted by a fuller realisation of the importance to it of sound vocational teaching in the schools than is general in this country. Good co-operation is also due to a very alert attitude on the part of the principals and staffs in the schools. . . . The policy of keeping the administration of vocational training in the hands of practical people clearly operated to the advantage of industry and impressed the Team very favourably.¹

(4) It is essential that those whose job is to instruct, even if only for part of their time, should have had some training in the art of imparting knowledge. Without such training only a man with unusual natural gifts will make a good instructor, however good a craftsman he may be. The T.W.I. ² job instruction course and other similar techniques can play a valuable part in assisting firms to overcome a shortage of men qualified to instruct apprentices. Even in educational establishments instructors in practical subjects are not always required to have taken courses in teaching methods. The team whose report has just been quoted was favourably impressed by the fact that this is commonly insisted upon in the United States.

(5) If apprenticeship is to serve the purpose of providing an adequate supply of skilled workers, it is important that the period of apprenticeship should not be needlessly long. For otherwise, not only may potential apprentices be deterred from signing on

¹ Training of Operatives, op. cit., p. 42.
² Training Within Industry.
but an urgent shortage of skilled labour will not be overcome as quickly as it could be.

The proper length of the period of apprenticeship for any craft is a difficult and controversial question. Trade unions are frequently opposed to suggestions that apprenticeship should be shortened. There will be general agreement that this should not be done at the cost of impairing the efficiency of the journeyman who has served his time. There may often, however, be room for impartial examination of the question whether a shorter period of improved instruction cannot fit a man equally well for the work he will have to do. It is believed that trade unions (and especially craft unions) are sometimes influenced in their attitudes towards the length of apprenticeship not only by the desire to maintain standards of craftsmanship but also by the desire to safeguard the craftsman who has served his time against the danger of a possible over-supply of a certain type of skill and a consequent risk of unemployment. It cannot be expected that such fears on the part of trade unions will be entirely overcome until governments and managements can convince workers that they have effective policies for maintaining full employment. Where they have felt that the interests of their members are adequately safeguarded, trade unions have however often been willing to review periods of apprenticeship and to agree to reductions or, recognising that some apprentices learn more quickly than others, to accept arrangements under which apprentices showing special promise can take trade tests at an earlier stage than usual, and if successful can be admitted as journeymen after having served less than the usual term of apprenticeship. It would appear that more might be done in this way to adapt the period of apprenticeship to the requirements of individual apprentices without relaxing standards of craftsmanship. The American practice of awarding credits to apprentices for work at vocational schools, which may enable an apprentice to shorten the period of his shop training considerably, appears to have much to recommend it.

(6) Related to the question of the duration of apprenticeship is the question of the maximum age of admission. Insistence that only those below a certain age may be admitted to apprenticeship may also be regarded by craft unions as a means of safeguarding the interests of their members. One of the most noticeable features of the United States system is its flexibility in regard to the upper age of candidates. Instead of the skilled man being
set apart from the rest of the labour force from the outset by entering industry as an apprentice, a very large proportion of those who ultimately become skilled appear to enter industry in the lowest grades and to work their way up as vacancies occur, being accepted for apprenticeship, if they show promise, sometimes after years of experience on unskilled and semi-skilled work.

Men can become apprentices up to even the age of 35 and are not expected to begin before they are 18. This gives great flexibility and avoids the stultifying effect of the over-rigid practice in Britain where entry into apprenticeship above the age of 16 is unusual.1

The British team which reported thus felt strongly that the question of age limits and periods of training for apprentices should be re-examined very carefully by all industries, "particularly now that compulsory National Service has become a permanent feature of British life".1

(7) Another related problem is the question whether all work which is considered to be skilled and to require the employment of workers who have completed an apprenticeship or equivalent training does in fact require such thorough training. Undoubtedly, with improvements in machinery and equipment and with the increase in the scale of production which permits the subdivision and simplification of operations, semi-skilled labour is in many fields being employed on work which was formerly the preserve of the craftsman. This raises a number of difficult questions.2 But if changes in equipment and techniques tend to reduce the demand for some kinds of skill, they offer new opportunities for the exercise of other skills—those of electricians, maintenance men, pattern-makers and others—and may create new openings for foremen and supervisors. The broader the substructure of basic training upon which specialised skills are founded, the easier it will be for the skilled labour force to adapt itself to changes in the proportions in which specific skills are demanded.

Training for Operatives

The notion that the best way of carrying out unskilled or semi-skilled operations can be learned on the job with only casual assistance from more experienced workers dies hard. It is, however, more and more widely recognised that the time required to

1 Training of Operatives, op. cit., p. 43.
2 See pp. 139-144 below.
learn a job can be shortened, the number of failures reduced, and the process of learning converted into a more satisfying experience, if adequate instruction is provided. Either instruction may be provided on the job from the start, or it may begin in a special training room equipped so far as possible with replicas of the tools and machines that the trainee will use on the job when he has become proficient enough.

A firm in which arrangements for the training of operative labour have in the past been casual and haphazard may encounter a number of practical difficulties in trying to improve the instruction given to this class of labour. To combine a production job with systematic instruction for new workers is seldom easy. When the amount of instruction to be given regularly in any department is sufficient to warrant the appointment of one or more full-time instructors, this may often be the best course to adopt. Management is, however, sometimes reluctant to take good men off production work, and the job of a full-time trainer or instructor sometimes carries neither the prestige nor the pay it deserves. Again, as has already been said, even if the instructor is himself a good workman, he will not necessarily be a good instructor. The T.W.I. job instruction course and similar techniques have recently been widely used with good results in improving the quality of instruction in industry.

It is, however, often not practicable to entrust the job of training operatives to full-time instructors. Productivity team reports published by the Anglo-American Council on Productivity, which now cover a wide range of United States industries, make it clear that even in the United States, where firms and departments are often larger than in other countries, and where more attention appears to be devoted to the training of operatives than is common in most other countries, a very large proportion of the work of training new operatives is carried out by workers who are themselves engaged on production jobs. The primary responsibility for instruction then rests with the foreman or supervisor; but he often has to delegate much of the actual instructing to other members of his team. Care may have to be taken to ensure that those to whom this work falls do not suffer in pay or prestige by comparison with other workers who are able to devote themselves entirely to production. They may also need some training in the art of instructing.

The view is sometimes expressed that there is one best way of carrying out every operation, that this best way can be ascertained
by means of motion study, and that once it has been ascertained every operative should be taught to do the job in this way and in no other. This view appears to take insufficient account of the differences between one worker and another. It is true that training and instruction can assist an operative to adopt a rhythmic sequence of movements and to eliminate unnecessary movements, but it would seem to be a mistake to insist upon a completely standardised sequence of movements.

Induction Courses

It is important that a new worker's first impression of his firm should be a favourable one. It is also important, if he is to have any sense of being a member of a team, that, whatever his grade or rank, he should be given some understanding of the structure and organisation of the firm, what it makes and what it does, and how his work fits in with that of other sections and departments. This is all the more important in a large concern, in which a new employee might otherwise feel that he is regarded as a mere cog in a gigantic, impersonal machine. To meet these requirements and to remedy in part the lack of day-to-day personal contact between employer and worker, which has been lost in modern large-scale industry, growing attention is being devoted to the organisation of brief induction courses for new employees. It appears preferable not to attempt to crowd too many new experiences into the first few days, but rather to spread induction courses over a certain period of time.

Induction courses which are allowed to degenerate into a perfunctory routine serve little purpose; but if management sees in such courses a real opportunity for enlarging the horizons and interests of new workers and associating them more closely with the firm, the time and trouble devoted to such courses will be well spent. Elaborate arrangements will seldom be necessary, and the more informal the atmosphere in which such instruction can be given, the more successful it is likely to be.

The British team which studied the training of operatives in the United States reported that—

The process of welcoming new workers, introducing them to the plant and giving them an appreciation of where they fit in to the industry is apparently often done most thoroughly in American firms. It seems likely that this has a good though unmeasurable effect on production. . . .¹

¹ Training of Operatives, op. cit., p. 44.
Normal training courses and facilities provided for all categories of employees should draw attention to the importance of higher productivity and stimulate a desire to find better ways of doing things. It may, however, be desirable, especially in countries, industries or undertakings where modern techniques for raising productivity are unfamiliar, to supplement ordinary training by special courses designed to train selected individuals in the particular techniques they need for initiating or taking part in programmes to raise productivity.

A number of industries in a number of countries have in recent years launched special programmes providing training in the techniques of higher productivity—often as a result of visits by productivity teams to the United States. One such programme is that adopted by the National Association of French Founders. According to a recent article 1, for the ten foundries participating in the experiment total annual savings of more than 150 million francs can be attributed to improvements introduced, or to be introduced, as a result of the experiment, and workers' earnings have increased. A further 20 undertakings began a similar experiment in June 1953. The article cited also contains accounts of the preliminary phases of special programmes adopted to raise productivity in the French men's clothing and footwear industries, and among administrative and military supply contractors.

As further examples of special training programmes designed to increase productivity, mention may be made of courses organised by I.L.O. technical assistance experts in Israel and India.

In Israel groups of about ten factories have been invited by the Israeli Institute of Productivity to select two persons (one in a management post and one worker) to attend a training course on time study and methods improvement. The first two weeks are devoted to intensive class and laboratory work. The teams then return to their respective factories and select a production process for improvement and time study. Six weeks are allotted for this assignment. Institute engineers visit the trainees throughout the course, and assist them in solving problems and over-

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coming difficulties. At the end of this period the teams reassemble, each team reporting on what it has accomplished and how it has arrived at the improvements.

As will be seen, the objective of the programme is to provide factories—mostly small ones which could not afford to hire production engineers—with at least two people on their pay-roll who have some training and experience in techniques for increasing productivity. The Institute remains in touch with the work of the trainees after the end of the course. It organises evening meetings twice a month in Haifa and Tel-Aviv at which lectures are given and ex-trainees discuss and analyse projects on which they are engaged. Firms employing ex-trainees are regularly visited by Institute engineers, who give further help and instruction if required.

Up to April 1953 four such courses had been held, attended by 88 trainees from 46 firms. Further courses are in progress. A report on the activities of the Israeli Institute of Productivity for the year ending in April 1953 states that this programme has been "very successful", and gives examples of increases in productivity achieved in a number of firms as a result of it.

An intensive six months’ course for work study or production technicians has also been organised. Of the first 30 people to take this course, about half were sponsored and had their fees (and salaries) paid by the firms that employ them. Others had their fees paid by the Government in return for an undertaking to work for two years after completing the course either for the Institute itself or for firms to which the Institute might assign them. The organisation of similar courses might prove to be of great value in other underdeveloped countries, for the needs of industry for the services of employees having an adequate grounding in the techniques of work study are too great to be met entirely by the training and employment of qualified production engineers, which would be both too slow and too costly.

The I.L.O. expert who organised these courses, in co-operation with the director and staff of the Israeli Institute of Productivity, has also provided more advanced training for the staff of the Institute and certain members of the staff of the General Federation of Labour, to constitute a pool of instructors or trainers for training factory personnel. A training manual has also been prepared.

In India brief training courses in productivity study techniques have been given to a number of management officials and labour
representatives from textile mills and engineering establishments. Most of the trainees were then made responsible for work studies in their own factories, at first with the assistance and guidance of the I.L.O. experts.

These are examples of special training programmes designed to enable selected individuals to apply particular techniques for raising productivity. In undertakings or industries where programmes for raising productivity are being applied, other kinds of special training programmes may be needed—namely, programmes designed to enable workers to adapt their skills to changes in production techniques or equipment. When such changes give rise to redundancy, or threaten to do so, it has already been suggested that accelerated training or retraining courses may be needed either to enable displaced workers to fill vacancies in existing processes, or because technological improvements often create new employment opportunities in new kinds of jobs and, provided adequate training facilities are available, may in certain cases open up opportunities for promotion.

**Upgrading and Promotion**

If a worker is to do his best work and to be encouraged to fit himself for more responsibility, it is important that he should feel he has a fair chance of promotion on merit. Few will deny that the continuing effectiveness of an organisation depends to a considerable degree upon the extent to which promotions are based upon ability.

The two main obstacles likely to be encountered in applying this principle are the difficulty of reconciling the claims of seniority and of ability as criteria for promotion; and the difficulty of recognising ability.

These two difficulties are not unrelated. If ability were something which could be objectively determined, the case for seniority rules, by which trade unions often set great store, would be greatly weakened. As things are, such rules provide a safeguard against

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favouritism and the dissatisfaction and lowering of plant morale which favouritism is likely to entail. They may also serve to discourage labour turnover (though even from this point of view their effects on productivity are not wholly good, since in some situations more and not less mobility of labour is required).

The two major disadvantages of seniority rules, to be set against these advantages, are that they may result in the promotion or upgrading of unsuitable workers and, secondly, that they may keep down ambitious and able younger men. The first of these disadvantages can be largely overcome if it is understood that seniority carries with it not a right to promotion but a right to be tried out in a higher grade job when a vacancy occurs, with automatic relegation to the previous grade in the event of a failure to make good in the new grade after a reasonable period of time, say 60 days. This is a widespread practice in United States industry. It does not, however, go far to meet the claims for rapid promotion of the able younger men. Greater flexibility can be introduced if agreement can be reached that in the determination of "seniority" weight should be given to attainments and performance as well as years of service. It is also desirable from the point of view of flexibility that the unit within which seniority counts for promotion should be as broad as possible, so that a man deserving promotion should not necessarily have to wait for a vacancy in his own department.

It is normally only up to a certain grade that promotion¹ is based on seniority (subject to ability to do the job), management being free to select employees for promotion beyond this grade on the basis of ability alone.

"Ability" is often spoken of as though it were something that could easily be recognised. Technical knowledge and performance can to some extent be tested, but the ability to get along with and handle people, and initiative and imagination, are much more elusive qualities. Only by carefully reviewing an employee's record, and by exposing him to situations in which these qualities are called for, is it possible to ascertain whether he possesses them. A number of productivity teams have commented on the trouble taken in United States industry to spot and develop talent in all ranks of workers and employees.

¹ A distinction is often drawn between "promotion" and "upgrading", "promotion" meaning promotion to or within the ranks of management and "upgrading" meaning promotion below the ranks of management. "Upgrading" in this sense is often covered by seniority rules while "promotion" is not.
Often the ability requisite for promotion can only be acquired through training. The provision of adequate training facilities is therefore a necessary part of a sound policy regarding promotion. If employees are carefully selected and appropriately trained, it should be possible to offer managerial vacancies to men already in the firm. "Managements", it has been recommended, "should have an agreed policy of promotion which should be known to the employees, so that each man can gauge the possibilities of promotion and should know what will be required of him if he is to be considered for promotion to specified positions." ¹

**Supervision**

Recent research has emphasised the importance of the supervisor-subordinate or leader-group relationship as a factor affecting productivity.² Special attention has been devoted to the role of the foreman or first-level supervisor. There is some evidence, based on studies made in a number of different industries, that the supervisors who get the best results, in terms both of productivity and of the satisfaction felt by members of their groups, tend to be those who—

(a) are recognised as being able to provide leadership and as possessing superior planning ability;

(b) do not attempt to supervise too closely, but leave scope for individual initiative;

(c) are "employee-oriented", at least in the sense of having a real interest in the workers and their motivations; and

(d) are able to create an esprit de corps in the section or work group.

Many of the difficulties of encouraging and developing these qualities among supervisors can be met by means of the careful selection and training of supervisors, the importance of which has already been emphasised. But this is not enough to ensure good supervision.

A problem that arises in some countries is the difficulty of kindling in a sufficient number of workers the ambition to rise to

¹ Lithographic Printing, op. cit., p. 55.
² See, for example, D. Katz and R. Kahn: "Human Organization and Worker Motivation", in Industrial Productivity, op. cit., pp. 146 ff., and the sources there cited.
supervisory status. When such ambition is lacking, the reason, it would seem, is often that the pay and status accorded to foremen and lower-ranking supervisors are inadequate. The same reasons that cause a shortage of suitable candidates for supervisory posts may be responsible for dissatisfaction and a sense of frustration among existing foremen and supervisors. There is a tendency in many industries to adopt new organisational methods that have the effect of changing, and in some respects undermining, the traditional status and responsibilities of foremen. With growing reliance upon specialist staff there has been a tendency to transfer prerogatives which formerly belonged to foremen to specialised departments, such as the recruiting and training services, the safety department, the welfare services and the planning department. When, in addition, as has sometimes happened, new machinery for labour-management co-operation has been set up which by-passes the foreman, it is small wonder that such remarks as: “What is there left for me to do?”; “They have taken all our authority away”; or “I am nothing but a letter-box” are sometimes heard from foremen.

It should be added that more recently there have been signs in a number of industries and countries of a welcome swing of the pendulum and a tendency to emphasise once more, in practice as well as in precept, the importance of maintaining the authority and responsibility of foremen. Where a foreman has little scope for the exercise of initiative and responsibility, this may have bad effects in various ways on the productivity of those working under him. As has been pointed out above, there is some evidence that supervisors who supervise too closely tend to get poorer results than those who leave more to the initiative of their men. But there is evidence, too, that the first-line supervisor tends to give to his men the same kind of supervision as he receives from his superiors—that “the style of supervision which is characteristic of first-level supervisors reflects in considerable degree the organisational climate which exists at higher levels in the management

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1 Several of the A.A.C.P. productivity teams draw attention to this problem as it confronts various branches of British industry. The Cotton Yarn Doubling Team, for example, considered that “there is an urgent need to improve the status of inside managers and overlookers. Until this is done there is little incentive for people inside the mill to equip themselves for such responsibilities, or for technically trained people to enter the industry. A shortage of suitably equipped personnel may well be a serious problem in the coming years.” (A.A.C.P.: Cotton Yarn Doubling (London, 1950), p. 49.) This problem is also acute in certain industries in Belgium, France and Italy.

Again, if the foreman feels cramped in the exercise of his responsibilities he will be handicapped in his efforts to provide effective leadership and to encourage a sense of pride in the work group.

The foreman who is given so little freedom or authority by his supervisors that he is unable to exert a meaningful influence on the environment in which he and his employees function will be ineffective in dealing with employees, regardless of his human relations skills.1

These considerations lend weight to the following recommendations of a British productivity team:

If supervision is to play its full part in promoting productivity, then all supervisors (above the level of working charge-hands, leading hands or setters, etc.) should be regarded as responsible members of the management team. This means that they should be carefully selected and trained, should be consulted and kept well informed about company policy and procedures and should be given adequate status and prospects of promotion by merit.2

There should be greater decentralisation of responsibility and authority to the various levels of line management and supervision, right down to the first-line supervisor. The first-line supervisor should be recruited with this aim in view and should be encouraged to regard himself as far as possible as a "manager of his own business".3

The function of specialist, service and staff departments should be to provide advice and assistance in consultation with line management at all levels rather than to impose procedures and methods. It is important that supervisors should be instructed how to make the best possible use of these departments.4

The line of executive authority down to the first-line supervisor should be maintained as the chief channel of communication in both directions.5

If the supervisor is to fill his role effectively and if men and women of suitable calibre are to be attracted to a supervisory career, the conditions and prospects of that career must be adequate. This means a sufficient salary margin above operative earnings at the first-line level, appropriate increases for higher levels and good promotion possibilities. The supervisor should enjoy full managerial privileges as regards holidays, sickness benefit and retirement grants.6

**Work Study, Work Simplification and "Job Satisfaction"**

The contribution that work study can make to higher productivity has already been emphasised.4 Certain aspects of

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1 Katz and Kahn, op. cit., p. 158.
2 Ibid., p. 159.
3 Training of Supervisors, op. cit., p. 35.
4 See pp. 92 ff. above.
work study which give rise to problems of personnel policy were, however, deferred for consideration in this chapter. Two problems will be considered here—first, the resistance sometimes encountered on the part of workers to the techniques of work study, and especially work measurement; and, secondly, the boredom and loss of satisfaction of workers if work simplification, as a result of work study, is carried too far.

The mistrust and resistance sometimes shown by workers towards the application of work study techniques, and especially techniques of work measurement, may be a legacy of faulty application of these techniques in the past. If method study has been used to break down and over-simplify work to the point where it loses interest and meaning for the workers; if work measurement has been used to set rates that have not been accepted by the workers as fair; if either or both techniques have been regarded as attempts on the part of management to speed up the work without due regard for the health and safety of workers or without giving them adequate compensation for increased efforts; then resistance is likely to be especially strong. The fact that techniques of work measurement are not entirely objective is another reason for mistrust.

The response of workers to attempts on the part of management to introduce or extend work study techniques is likely to depend partly on their past experience of such techniques and partly on the quality of industrial relations in the undertaking. All that has been said in earlier chapters about the attitudes of employers and workers towards higher productivity is relevant in this connection. It is important that management should explain its plans fully and give opportunities for workers to express their views; that there should be confidence that the benefits resulting from work study will be fairly distributed; and that every attempt should be made to agree upon procedures for protecting the interests of workers who may be displaced or regraded in the course of changes introduced as a result of work study.

If industrial relations are poor, a sincere attempt to improve them may have to be made before any worth-while results can be expected from work study. When industrial relations are good, difficulties regarding work study and changes resulting from it can usually be resolved if employers have a good case for the changes they propose, particularly if workers' representatives are given an opportunity to participate in the technical processes of work study and especially of work measurement. What form this
participation should take is a matter for negotiation. Unions will, however, commonly prefer that union time study men should have the right to check times and rates set by management rather than that they should take joint responsibility for the times or rates set. If they help to set the original rates they will be subject to criticism, just as management is, whenever a rate is too tight. On the other hand, when they secure a change through grievance procedures they demonstrate the benefits of the union to the workers. If no opportunities for workers' participation are given, workers may well be reluctant to accept on trust the results of studies undertaken by or on behalf of management.

One obvious difficulty is that effective participation in work of this kind requires technical qualifications that the ordinary workers' representative does not possess. The International Confederation of Free Trade Unions has expressed the view that "trade unions should have the right to check all times and rates; for this, if appropriate, they should train their own technicians." 1 A number of United States trade unions have established engineering and research departments, and train officials in the techniques of time and motion study and rate-fixing so as to enable them to check the times and rates fixed by management. In countries where unions are financially less strong than in the United States they may be able to provide jointly for the training of a certain number of officials in these techniques. In France such training courses are provided by the Trade Union Productivity Study and Research Centre. In the United Kingdom a team of trade union officials who visited the United States has recommended that the large unions and federations should train and employ their own production engineers to study work loads and employers' plans for reorganisation, and that the Trades Union Congress should train or employ similar experts for the use of small unions. 2 A number of British trade unions, and the T.U.C., have taken steps to carry out these recommendations. Some unions, indeed, were already providing such training. The T.U.C. has initiated courses in production and management techniques and their industrial and trade union implications, and a number of trade unions have arranged for selected national officers to undergo periods of training

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2 Trade Unions and Productivity, op. cit., p. 60.
with firms of industrial consultants. In the Scandinavian countries, too, a great deal of emphasis is placed upon the training of trade union officials in work study techniques. This is indeed a matter to which the trade union movement throughout the world is giving increasing attention.

Employers frequently co-operate in providing such training for union officials. The British Institute of Management has recommended that, in order to win the confidence of employees at all levels, an employees' representative should be trained in time study techniques in all cases where they are used, and should be authorised to check any times arrived at by the management's time study engineers. A committee was set up in 1951 to organise trade union co-operation with the British Institute of Management, to which some 25 unions subscribe. Through publications and conferences this Institute has contributed much to the education of trade unionists in production subjects.

Work study does not always lead to simplification of the work of the individual worker; its principal results may be improvements in plant layout, production control or materials-handling. Conversely there may be cases where work is simplified without any prior systematic work study. Work study and work simplification do, however, very commonly go together. The most practical, economic and effective method of doing a job, as determined by work study, will very often be a method that simplifies the work of the individual worker. Where such simplification takes the form of improvements in the arrangement of the work post or other changes eliminating unnecessary movements and reducing fatigue without impairing the interest and satisfaction derived from the work, it may make an important contribution to higher productivity and may be welcomed by workers—at

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1 The National Union of Boot and Shoe Operatives and the Amalgamated Weavers' Association were among the first unions to have officers trained by industrial consultants. They reported good results and the T.U.C. recommended that other unions should follow this lead.


3 Workers themselves are often able to improve and simplify their own methods of work. They can be encouraged to do so, as has already been mentioned, by means of suggestion schemes and by creating a psychological climate favourable to higher productivity.

4 "Work simplification has an important bearing on higher productivity; . . . Recommended that management investigate suggestions for simplified methods, particularly from those directly responsible for the operation under review." (Lithographic Printing, op. cit., p. 19.) "Motion study should be used more widely to reduce unnecessary movements by operators, and so avoid fatigue, and as an aid to more efficient arrangement of work." (A.A.C.P.: Pharmaceuticals (London, 1951), p. 12.)
least after they have had time to get used to the initial change.

A number of cases have been reported, however, in which work simplification has been carried so far as to defeat its own purpose of raising productivity by depriving the work of all interest or meaning for individual workers. In a well-known British study, the results of a considerable number of tests were summarised as follows:

Complete uniformity in manual repetitive work is generally less productive and leads to greater irregularity in the rate of working than a reasonable degree of variety, which is also preferred by the workers. . . . ¹

An example may be taken from a more recent United States study of a plant engaged in the manufacture of plastic raincoats. In the department where the raincoats were assembled, work simplification had been carried to great lengths, so that one girl would cement the two pieces for the back, another would put on the sleeves, a third would attach the collar, and so on. Management decided to experiment by changing the organisation of the work to have each girl assemble a complete raincoat from materials delivered to her bench. The results were gratifying both in productivity and morale, since the girls not only produced more but said that they found the work more enjoyable. Whyte comments as follows on this experience:

Management will do well to balance the anticipated advantages [from the breaking down of jobs into simple processes] with the possible losses in morale among employees who find that they are doing a monotonous and apparently meaningless job.

Furthermore, this scientific management approach tends to divide the plant into two classes of people; the experts who plan, organise and lay out the work, and the human automatons who follow orders and do the work. A good deal of research shows that productivity and morale are both higher when employees have an opportunity to influence the way in which the work gets done.

This standardisation and specialisation approach tends to put management in the position of making and enforcing the rules. It makes impossible the sort of collaborative activity which seems to build good morale and good production in the work force.²

¹ S. Wyatt and J. A. Fraser: The Comparative Effects of Variety and Uniformity in Work, Medical Research Council, Industrial Fatigue Research Board, Report No. 52 (London, H.M. Stationery Office, 1928), p. 3. Irregularity in the rate of working is, of course, not possible on a moving assembly line since, whatever the worker may feel, he must as a rule work at the same pace. Even in this case, however, satisfaction or the lack of it may be indirectly related to output by affecting absenteeism and turnover, and possibly in some cases work stoppages.

It appears that the intrinsic nature of the work, and the satisfaction that workers get out of it, are more important factors affecting morale and productivity than employers sometimes realise. In a nation-wide poll in the United States 3,000 employees and several hundred employers were asked to rate in order of importance eight factors affecting morale. Employers put fair pay at the head of the list and credit for work done seventh. Workers put credit for work done first, interesting work second and fair pay third.¹

Katz, summarising the significance of a number of studies in morale and motivation, has remarked—

Though these specific studies do not really establish the fact that wages and security are less important than other factors, they are in agreement with general findings in the field that point to the significance of the work itself, the recognition given the workers, and the social satisfactions obtained from personal associates. . . .

The central fact about the outcome of studies of worker morale is that they do not corroborate the general philosophy of management that emphasises the importance of external rewards. Workers like jobs that give them a chance to display their skill and to show their worth, and they place considerable value upon being a member of a congenial work group. . . .

People are more effectively motivated when they are given some degree of freedom in the way in which they do their work than when every action is prescribed in advance. They do better when some degree of decision-making about their jobs is possible than when all decisions are made for them. They respond more adequately when they are treated as personalities rather than as cogs in a machine. In short, if the ego motivations of self-determination, of self-expression, of a sense of personal worth can be tapped, the individual can be more effectively energised.²

There is no one solution to the problems raised by the inevitably repetitive nature of many jobs in modern industry. Some workers suffer more from monotony than others, and the selection and placement of workers on the basis of psychological tests may help. For the rest, answers may be sought, it has been suggested, along three different lines³—

1. Through changes in work organisation. Drucker has discussed this point and has suggested in effect that work simplifi-

² D. Katz: Morale and Motivation in Industry, mimeographed document (Survey Research Center, University of Michigan, 1949), pp. 5, 7 and 9.
cation has gone too far when it completely precludes any participation by workers in organising their own jobs.

To... [the industrial engineer] the human being is the more productive, the more thoroughly his work has been set up and laid out for him.

The social scientist lays stress on man’s need to participate. He therefore concludes that the human being is the more productive and the more efficient, the more he himself designs and lays out his own work.

The solution of this conflict seems to lie in the approach to the problem of the individual and the group. . . . It would seem to follow... that the spot to apply scientific management is not perhaps the work of the individual but the work of the group. It would also follow that the place where the individual should be given and can be given participation in the decisions regarding his own work is the group. The work of the group, in other words, should be set up by scientific management and on industrial engineering standards. But within the group there should be considerable latitude to enable the members to organise the work their own way.\(^1\)

Walker quotes an example of the practical application of this idea, with favourable results, as follows:

In a truck assembly plant, certain sub-assembly lines have been so organised that the men work in teams of four, each team directing itself to assembling a certain section of the body. Any one of the four jobs on the team would be boring if continuously performed by one worker, especially if he were in no functional relation with anyone around him. As organised in this plant, however, each man is a member of a team. Each helps the others on specific operations, and all rotate between jobs. Finally, the system of rotation is up to the individual team. Some teams “change around” twice a day, some once a week. Management reports that this work arrangement has resulted in higher production than any other. The union to which all the men belong has no objection to the arrangement.\(^2\)

(2) Through enlargement of the job content. It is often supposed that the engineering principles of mass production make it virtually impossible to provide workers with anything but over-simplified tasks, demanding little or no skill, interest and responsibility. It is true that the technique of breaking down jobs into their simplest constituent elements is a sound tool of industrial engineering; but it does not follow that a worker can learn and execute efficiently only a very small number of basic motions. It is often possible to recombine the elements

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2 Walker, op. cit., p. 207.
of the work to be done in such a way as to enlarge the content of the job and give it more interest and meaning for the worker.

In a certain typewriter plant, workers were recently given jobs requiring four to five times as long a time-cycle as formerly, together with added skill and responsibility. The workers insist that they would never go back to the simpler jobs they had formerly held.

In the machinery division of a large business-machines manufacturing plant, the jobs of operators have been "enlarged" to include the duties of set-up men and inspectors. The company reports higher morale, and a great saving in rejects. A survey shows the men prefer the enlarged jobs.

On the assembly line of a bottling concern, workers, instead of remaining stationary as the line moves past them and performing one job only, move up the line and perform several jobs, with good results both in morale and output.¹

It is true that other studies have shown that workers accustomed to uniformity in the methods and conditions of work are often reluctant to change to a more varied form of procedure. Baldamus ² suggests that this may be related to a desire to conserve conditions in which they have been accustomed to develop a "working mood", which he describes, drawing on his own experience of repetitive factory work, as a mildly pleasant state of mind in which work proceeds steadily without a conscious effort of will.³ "It is no contradiction", he adds, "that experiments with 'variety in work' have on the whole been positive as regards contentment and output; the point is that the benefits of more varied work... only appear after a period of adjustment, that is, after the very changeover has become part of an established working mood." ⁴

One reason for a preference for "longer-cycle" jobs may be that it requires more effort of will to start a new cycle, or to join two cycles, than to complete a cycle already started. A cycle, once started, may be thought of as possessing a certain momentum which, as it were, carries the worker along with it. It is known from various studies on repetitive work that subdividing a large number of articles or components into smaller groups helps to diminish the feeling of tedium. The explanation may be that a desire to complete a batch exerts a "pull" or "traction" similar to the "traction" exerted by a single longer-cycle job.

¹ Walker, op. cit., p. 208.
³ He also suggests that minor imperfections in materials, machines or tools, because they disrupt or prevent the establishment of a "working mood", may have adverse effects on contentment and output that are out of proportion to their intrinsic importance.
⁴ Baldamus, op. cit., p. 27.
(3) Through more mechanisation. It is, at first sight, paradoxical to suggest that some of the harmful effects of over-simplification of work can be met by yet more mechanisation. Yet it appears that—

From the standpoint of the average worker, adjustment to a job which is so "mechanical" that it can "be done without thinking" is far easier than adjustment to a job which requires continuous but superficial mental attention. If the attention required is attention in depth, calling upon skill, judgment and experience, a job may become satisfying and absorbing. It is the jobs which require high surface attention but little or no skill or experience, however, that present the most difficult problems of adjustment. One answer then, as Wyatt and Fraser and later Mayo have pointed out, is to increase the degree of mechanisation till the operator can literally do the job without thinking, and release his mind for conversation with his fellow workers or for thinking his own thoughts.¹

The Director-General of the I.L.O., in his Report to the 36th International Labour Conference, said that—

If intelligence and imagination are used, I do not believe that there is any reason why measures to raise productivity through simplification of operations should be associated with a loss of the satisfaction which workers derive from their jobs. For most people, indeed, knowledge that their services are being effectively utilised, and that they are not being made to waste time and effort as a result of faulty organisation, is in itself a considerable source of satisfaction.²

THE SERVICING OF SKILLED WORKERS

One advantage of work study to which special attention may be drawn is that it shows up, and indicates how best to eliminate, a widespread source of waste and inefficiency that is especially important whenever there is a shortage of skilled labour—namely, the waste that occurs when a skilled man has to spend a considerable part of his time on work for which his special skills are not required. The better "servicing" of skilled workers is mentioned time and again in productivity team reports as an important factor contributing to higher productivity in the United States.

The team representing the British steel founding industry, for example, reported that in United States steel foundries—

...skill, once acquired, is not wasted. A man who is deemed capable of ramming facing sand is not required to waste his time fetching it;

¹ WALKER, op. cit., p. 209.
a skilled closer on an intricate job has the job so organised for him that every core, chill and chaplet is ready to hand as he requires it.\(^1\)

The team went on to recommend that, in the United Kingdom, "an overhaul of shop management methods is desirable, especially paying attention to the efficient servicing of skilled men".\(^2\)

Similarly the pressed metal productivity team reported that in the United States—

A skilled man may be supplied with materials mechanically, or, where that is not possible, he is "serviced" by one or more labourers, who also remove the finished work.\(^3\)

This team recommended that—

The labour of skilled men and, correspondingly, the time of the machines should not be wasted by operators doing jobs other than operating machines. Where necessary, service to the operators should be supplied either mechanically or manually.\(^4\)

The grey-ironfounding team reported that—

In the usual moulding operations of some jobbing foundries in Britain the skilled moulder very often does not spend more than half of his time in the actual production of moulds; the other half is spent in general labouring, conveying of moulds to the floor, pouring and knocking out, etc. . . . One of the reasons for the higher production in the foundries of the United States was evident in the majority of the 24 foundries visited. They have realised that this work can be done more expeditiously and economically by lower-rated labour, with the judicious addition of mechanical appliances together with adequate available power.\(^5\)

The drop-forging team insisted that—

... the hammer man (or press operator), who alone can obtain maximum utilisation of every blow, should be so serviced that he performs no unproductive work. He must not be limited by having to perform the ancillary operations of fetching bars or pieces from the furnace, passing forgings for clipping and so on. These operations are better performed by a helper or by mechanical handling devices.\(^6\)

**Wage Policy**

*Payment by Results*

The earnings of individual workers or groups of workers may be related to individual or group output, provided that this can be measured, by means of individual or group systems of payment

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2. Ibid., p. 39.
4. Ibid., p. 51.
by results. Such systems have been discussed at length in another recent I.L.O. report, a chapter of which reproduces the conclusions of a tripartite meeting of experts on this subject convened by the I.L.O. in 1951. It will be sufficient here to draw attention to a few points of major importance.

In the first place, there is evidence from a number of industries and countries that payment by results is often associated with relatively high productivity. Examples are given in the report just referred to. In addition, examples of productivity (or rather of man-hours expended per unit of product—i.e., the inverse of productivity) in certain United States industries are to be found in studies by the U.S. Bureau of Labor Statistics. In the machine tools industry, indices of unit labour requirements for firms classified according to the system of wage payment in use showed that establishments employing some type of incentive system experienced much more favourable productivity trends during virtually the whole period 1939 to 1947 than did those paying wages on a time-rate basis. The comparison is shown in the following table:

**UNITED STATES: INDICES OF UNIT LABOUR REQUIREMENTS IN THE PRODUCTION OF SELECTED TYPES OF MACHINE TOOLS, BY TYPE OF WAGE PAYMENT PLAN**

\[1939 = 100\]

<table>
<thead>
<tr>
<th>Wage payment plan</th>
<th>1940</th>
<th>1941</th>
<th>1942</th>
<th>1943</th>
<th>1944</th>
<th>1945</th>
<th>1946</th>
<th>1947</th>
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<tr>
<td><strong>Total factory man-hours</strong></td>
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<tr>
<td>Incentive . . . .</td>
<td>95</td>
<td>97</td>
<td>98</td>
<td>96</td>
<td>98</td>
<td>100</td>
<td>99</td>
<td>106</td>
</tr>
<tr>
<td>Hourly wage . . .</td>
<td>101</td>
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<td>105</td>
<td>96</td>
<td>116</td>
<td>124</td>
<td>140</td>
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<td><strong>Direct labour man-hours</strong></td>
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<tr>
<td>Incentive . . . .</td>
<td>98</td>
<td>95</td>
<td>91</td>
<td>85</td>
<td>84</td>
<td>84</td>
<td>84</td>
<td>90</td>
</tr>
<tr>
<td>Hourly wage . . .</td>
<td>112</td>
<td>100</td>
<td>98</td>
<td>91</td>
<td>110</td>
<td>116</td>
<td>133</td>
<td>129</td>
</tr>
<tr>
<td><strong>Indirect labour man-hours</strong></td>
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<td>Incentive . . . .</td>
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<td>100</td>
<td>104</td>
<td>106</td>
<td>111</td>
<td>112</td>
<td>109</td>
<td>116</td>
</tr>
<tr>
<td>Hourly wage . . .</td>
<td>100</td>
<td>107</td>
<td>118</td>
<td>104</td>
<td>129</td>
<td>143</td>
<td>157</td>
<td>143</td>
</tr>
</tbody>
</table>


1 I.L.O.: Payment by Results, Studies and Reports, New Series, No. 27 (Geneva, 1951).

2 In cases where payment by results and high productivity are found together, it cannot be assumed that high productivity is necessarily a result of the incentive wage plan. It may be that both are results of one or more other factors; for example, more efficient and alert management, better labour-management relations, or better organisation of the work.
In the same way, in the industry producing household electrical appliances, firms with an hourly wage system experienced a 15 per cent. increase in total factory unit labour requirements between 1939 and 1947, while firms with an incentive plan experienced a 14 per cent. drop.¹

Systems of payment by results are, however, not likely to yield advantages on balance unless certain conditions are fulfilled. The most important of these conditions would appear to be, first, that before the introduction of such a system everything possible should have been done to improve and standardise methods of production; second, that the system should be fair; third, that it should be reasonably simple; and fourth, that good relations should prevail between the management and workers concerned, and that the workers should have confidence in the scheme.

If a system of payment by results is introduced before the possibilities of improving methods of production, tooling, layout, etc., have been thoroughly explored and, wherever possible, acted upon, all sorts of difficulties which could have been avoided are likely to be encountered. Changes that should have been made before the system was introduced will have to be made afterwards. They may give rise to long and difficult negotiations, and needlessly frequent changes are likely to undermine confidence in any scheme.

The fairness of any system of payment by results will depend largely upon the accuracy with which it is possible to measure the "work content" of a job. Where this cannot be done accurately, so that piece-rates or bonuses have to be fixed in an arbitrary fashion, there is great danger that the results will be seriously inequitable as between different categories of workers and that this will lead to rate-cutting, or to go-slow tactics on the part of some workers in order to avoid rate-cutting, or at least to general dissatisfaction. The accurate measurement of the work content of a job commonly requires time studies, which have already been discussed. In the case of a small firm, or in a jobbing shop, where the employment of experienced time-study engineers is not justified, the times allowed will have to be very carefully estimated by someone thoroughly familiar with the work.

Besides being fair, systems of payment by results should be simple enough to enable a worker to calculate without difficulty

what is due to him. There appears to be widespread agreement that, where payment by results is adopted, the more directly and quickly payment can be related to output the better. Some British employers with experience of systems of payment by results are convinced that, if a system is complicated, the fact that it may be perfectly fair will not make it effective; whereas so long as it is simple it may be effective even if slightly inequitable.\(^1\) Added force is also given to wage incentive schemes if the practice is adopted of making up bonus records promptly and keeping workers informed from day to day of the bonus earned.

A reasonable degree of fairness and simplicity is necessary if workers are to have confidence in a system of payment by results. Such confidence can be greatly strengthened if, in addition, as was recommended by the meeting of experts to which reference has already been made, workers are taken into the confidence of management from the outset and if all the features of a proposed scheme, and the reasons for introducing it, are carefully explained to them in advance. The meeting of experts suggested that provision should be made for workers' representatives to participate in the introduction of such a system. Participation may take the form of sharing in the timing of jobs, in fixing production standards and in setting rates\(^2\); or of collaboration in the establishment of appropriate safeguards.

Among the safeguards which it would seem generally desirable to include in any scheme of payment by results\(^3\) are the following:

\((a)\) There should be a trial period, during which any necessary changes may be agreed upon between management and the workers' representatives before a system is finally applied.

\((b)\) Thereafter, rate modification should only occur for agreed reasons such as changes in job content, equipment or methods of organisation, or the correction of clerical errors.

\((c)\) Workers should be guaranteed minimum earnings for any period in which output is affected by causes beyond their control.

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\(^2\) As has been suggested above (pp. 137-138) workers' representatives will often prefer to be given facilities for checking rates and times fixed by management rather than accept joint responsibility for fixing them.

\(^3\) For a more complete treatment of this subject see *Payment by Results*, op. cit., Chapter VII.
(d) The safety and health of workers should be adequately protected.

(e) Quality should be safeguarded.

Group incentive plans may have advantages over individual incentive plans, particularly in three types of situation—

(1) conveyor work, where operators cannot produce any more work than is passed to them by the operators preceding them in the production line;

(2) other work where the quality and handling of one operation can greatly affect the subsequent operation; and

(3) work of such a varied nature, both as to kind and quantity, as to make individual measurement impracticable or excessively expensive.

Group incentives may promote team spirit among workers, the group tending to assume responsibility for the efficiency of its members. On the other hand the reverse may also happen, particularly if the group is too large. Discontent instead of team spirit may arise if some members of the group resent having to "carry" others whom they consider less efficient.

It often happens that the introduction or revision of a system of payment by results is accompanied by other changes, which themselves affect productivity; for instance, a new effort may be made to secure the co-operation of labour, new machinery or methods may have to be introduced, new arrangements may be necessary to secure a smoother flow of materials or greater continuity of operations, etc. Productivity gains may be attributable to these accompanying changes as much as or more than to the new incentives that a system of payment by results gives to workers.

Direct payment by results appears to be less widespread in United States industry than in a number of European countries (though other incentives, such as opportunities for promotion to well-paid jobs, team approbation and team spirit, are probably stronger). It is, however, a common practice in American industry to fix standards of output expected of workers and to dispense with the services of workers who after a time do not attain these standards. An element of incentive can thus be combined with payment by time.

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A general question arising in connection with all varieties of systems of payment by results as ordinarily understood is whether it is right that payment should be related exclusively to the *quantity* of work produced. Many other qualities which go to make the best type of worker may be overlooked if quantity of work is regarded as the sole criterion of an efficient employee.

In both the United States and the United Kingdom there appears to be a growing body of thought in favour of a type of bonus scheme known as "merit rating" or the "individual assessment" bonus scheme.¹ This is based on a careful assessment of each worker at set intervals (three or six months) in regard to his output, quality of work, timekeeping, general ability, cooperation with supervisors and fellow-workers, and other factors. Points may also be awarded for the unpleasant or difficult nature of the work. Each of the qualities selected is allotted a number of points and weighted in accordance with its relative importance. The total of points awarded to each employee is converted into a weekly cash payment to be added to the standard rate. The assessment remains effective until the next review period, thus ensuring steadiness of earnings by the individual over the period. Opportunity is taken at the time of the assessment to point out to the worker the qualities in which he is weak and to encourage him to improve them before the next assessment period. Assessments are carried out initially by the charge-hand in consultation with the foreman in charge, and checked by the departmental superintendent or manager and finally by the general manager.

One advantage of this type of scheme is that it can sometimes be used to tidy up a complex wage structure which includes a variety of grade rates, lieu rates, dirt money, etc. All these can be covered by the assessment but, where the cash value of this amounts to less than the plus rates previously paid, it is usual to maintain the previous bonus for a fixed period or until it is earned by an improved assessment. Another advantage is that movements from one job to another are greatly facilitated, since no changes in individual earnings are involved. Management may also have more incentive to introduce improved methods when this can be done without necessitating changes in basic rates or standard times.

Whatever the attractions of a scheme of this kind in principle, it is evident that its successful operation in practice calls for the

very highest degree of confidence on the part of workers in the fairness and objectivity of supervisors and management. Where such confidence prevails, it is claimed for the scheme that it possesses high incentive value, not only to improve the quantity of work but also to develop the other qualities on which the assessment is based. Merit-rating schemes have been introduced by a number of firms in the British printing industry, for example, and among companies investigated increases in labour productivity ranging up to 10 per cent. are reported to have resulted from their adoption.\(^1\) Trade unions in the United States however appear to be fairly solidly opposed to merit-rating schemes, believing that they involve too great a risk of abuse and favouritism, and place too much power in the hands of foremen. It is clear that “merit rating should only be adopted where management has determined to spend the substantial time necessary to ensure careful training of assessors and equitable assessments”.\(^2\)

When individual or group output is not easily measurable, or when there are other obstacles to the operation of schemes based on payment by results, which link earnings directly to output, profit-sharing schemes may be employed.\(^3\) Or these may be employed in conjunction with systems of wage payment which link workers’ earnings directly to their output. The idea of profit-sharing has always found many adherents in Germany.\(^4\) Profits, of course, depend upon other factors—market conditions, price fluctuations and so on—besides productivity. For this reason, and because the group is often too large and the individual share in profits too small and too long-delayed to serve as an effective incentive to higher output, profit-sharing schemes should not be regarded primarily as a method of inducing workers to put forth greater efforts. The main value of successful profit-sharing schemes seems to lie in the contributions they may make towards a spirit of collaboration and a sense of partnership between employers and workers in an undertaking in which they have a common interest.

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\(^2\) Stewart, op. cit., p. 461.


The Structure of Wage Rates

Subject to the payment of adequate rates to the lowest-paid workers, it seems desirable in the interests of productivity that the structure of wage rates, and in particular the difference between skilled and unskilled rates and that between skilled rates and the remuneration of foremen and supervisors, should be such as to give workers every incentive to improve their qualifications. The need to combat inflation and at the same time to maintain minimum standards for the lowest-paid workers in the face of rising costs of living appears to have led in a number of countries to a narrowing of differentials between skilled and unskilled wage rates in recent years.\(^1\) While wage differentials provide only one among a number of incentives to acquire skill, the narrowing of differentials has given rise to a certain amount of concern; this is illustrated in the following extract from a letter to *The Economist* by an executive in a British engineering company:

> . . . The difference in pay between unskilled, semi-skilled and skilled labour is now so narrow that there is little incentive to serve apprenticeships as was the practice 15 to 20 years ago. This results in an increasing difficulty in obtaining skilled labour, and a tendency for mediocrity to spread throughout industry. The only way to keep up the quality of output is to employ more administrative and executive staff with a consequent rise in overhead costs.\(^2\)

A Belgian productivity team has reported that in United States foundries there is a greater difference than in Belgium between skilled and unskilled wage rates, and that this is certainly one cause of the desire to learn shown by American workers and their sons.\(^3\)

Job evaluation, applied with the co-operation and approval of the workers concerned, has in many cases played an important part in establishing an equitable wage structure which encourages workers to improve their skill. The purposes of job evaluation are: (a) to describe and assess the value of all jobs in a plant by systematic, standardised procedures; and thus (b) as far as possible to prevent anomalies in the earnings of the different categories

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\(^3\) Fabrïmetal: *Productivité des U.S.A. dans l'industrie de la fonderie de fer* (Brussels, 1952), p. 64.
of workers. A recent survey by the Dartnell Corporation of Chicago found that in the majority of cases studied job evaluation had, among other effects, improved industrial relations, lowered unit costs and increased productivity.

**Hours of Work**

Moderate increases in the hours typically worked in peace-time (at least in the more highly industrialised countries) would often result in an increase in total output. Unless, however, workers had previously been working well within their capacity, output per man-hour would tend to fall off. Measured in terms of output per man-year, productivity would in these cases increase; measured in terms of output per man-hour it would decrease.

Even if we are chiefly concerned with output per man-year, longer hours of work are still, in normal circumstances, of questionable advantage. Against any gain in the form of higher weekly output has to be set the loss of satisfaction resulting from loss of leisure. Workers' health may suffer from increased fatigue and strain, and absenteeism and work injuries may increase. If longer hours take the form of an increase in normal weekly hours, this represents a deterioration in workers' conditions to which trade unions cannot normally be expected to agree, though there might occasionally be room for negotiations aimed at combining a moderate increase in normal hours with a rise in basic rates of pay. In the more usual case where longer hours take the form of increased overtime, unit labour costs go up. It is true that the advantages of fuller utilisation of capacity and the spreading of overhead costs over a larger output may prevent a rise in total costs per unit; but much, if not all, of the financial advantage of working longer hours may be lost.

On the whole, except in occasional cases where hours of work are for one reason or another unusually short, and in cases of

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1 For a fuller discussion of job evaluation see *Payment by Results*, op. cit., pp. 41-45, and the works there cited.
4 Wartime experience in a number of countries, including the United Kingdom and the United States, shows that an increase in accidents, injuries and absenteeism often accompanies excessively long work schedules. Such schedules may increase output for short periods of emergency, but over extended periods Nature takes its revenge.
emergency when increased output is needed at almost any price, it would seem that an increase in hours of work as a means of promoting higher productivity will seldom be justified. The International Confederation of Free Trade Unions has expressed the view that “overtime... should only be introduced, subject to an agreement with the trade union concerned, when all other practicable means have been exhausted”.

Though in advanced industrial countries normal hours of work in manufacturing industries today are probably seldom, if ever, longer than those which would yield the maximum output per week, this may not always be true in underdeveloped countries, where a reduction of actual daily or weekly hours of work might sometimes increase not only hourly but also weekly output.

Better organisation of working schedules, and appropriate rest periods, may sometimes help to improve productivity even if total daily or weekly hours are unchanged.

Number of Shifts

Machinery and equipment are becoming more and more important in production, and in many branches of industry the pace of invention, or the rapidity with which consumers’ tastes and fashions change, is such that expensive machines are liable to rapid obsolescence. In these circumstances it is important that the fixed overhead costs of obsolescence and depreciation should be reduced to the minimum cost per unit of output by increasing so far as possible the output of each machine. One of the advantages of longer hours of work is that they enable machinery and equipment to be more fully utilised. This advantage can sometimes be secured in a much greater degree, without lengthening hours of work, by substituting two or three shifts for a single shift. In particular, by concentrating work on the most up-to-date equipment in existing factories, employers would in many cases be able to scrap old and out-of-date plant without having to face the problem of replacing it by new plant, which in many countries has been difficult to obtain since the war. As a result, more space would be available in existing factories and this would facilitate replanning on more efficient lines. There would also be less need for the erection of additional buildings; and the financing of re-equipment from within the business, now so difficult in many

1 Labour Productivity, Manpower, Prices and Wages, op. cit., p. 5.
countries because of the combination of high prices of machinery and high rates of taxation, would be facilitated. Another important advantage from the national point of view is that shift working would effect a considerable spreading of electric power loads. The economies resulting from more efficient utilisation of capital equipment would make it possible in many cases to offer workers either higher wages or shorter hours or both.\(^1\)

It appears to be much more usual to work two or three shifts in the United States, notwithstanding the comparative abundance of capital equipment there, than in most other countries. Among United States industries in which, according to productivity team reports, two or three shifts are either the usual practice or are commonly resorted to when necessary, without opposition from the workers or unions, are the pressed metals industry; the electrical manufacturing industry; the internal combustion engines industry; the wrought non-ferrous metals industry; the brushes industry; the cakes and biscuits industry; the cotton spinning, weaving and yarn-doubling industries; the hosiery industry; letterpress printing; lithographic printing; the packed foods industry; pharmaceuticals; and the industry making rigid boxes and cartons. Some of the productivity teams recommended greater use of shift working in their own countries.\(^2\)

In the United Kingdom, an investigating committee recently recognised a number of advantages in the system of double day-shift working and concluded that “the facts adduced in the evidence presented to us . . . prove, we think, that the wider use of the double day-shift in industry is undoubtedly capable of making an important contribution to the well-being of the country”.\(^3\) Hutton believes that the limited degree to which shift work is resorted to in Britain may contain “much of the explanation for the long lag in British productivity during the past twenty-five to thirty years”.\(^4\) The National Joint Advisory Council has had under consideration the desirability of extending double day-shift

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\(^2\) Cf., for example, *Letterpress Printing*, op. cit., p. 22, and *Lithographic Printing*, op. cit., p. 19. It was later reported that there has recently been some increase in double-shift working, especially in lithographic printing, in the United Kingdom, and that as a result at least one company has been able to dispose of old machinery and to concentrate on up-to-date machines (*A Review of Productivity in the Printing Industry*, op. cit., p. 15).

\(^3\) *Report of the Committee on Double Day-Shift Working*, op. cit., p. 25.

\(^4\) *We Too Can Prosper*, op. cit., p. 108.
working in British industry as a practical means of contributing to increased production and lower production costs. It has invited the Minister of Labour and National Service to approach employers and workers in selected industries where there may be scope for an extension of the system.¹

Obstacles liable to be encountered if an attempt is made to increase the number of shifts worked include, on the employers' side, certain difficulties of organisation and supervision. There may, for example, be difficulties in fixing responsibility for the care of machines or for faulty workmanship. But such obstacles appear to have been satisfactorily overcome in a large number of United States industries, and should not be insuperable elsewhere.

From the workers' point of view, too, shared responsibility for a machine or for a particular piece of work may give rise to difficulties, especially where incentive systems of wage payment are in use and where a particular job is done partly in one shift and partly in another.

More serious from the workers' point of view are the physiological and psychological difficulties of adjusting their routines of living—mealtimes, hours of sleep, recreation and work—to a changed timetable.

Night work is not merely inconvenient and disagreeable but involves some risks to health, particularly through insomnia and fatigue. Workers rarely find favourable conditions for recuperating from the fatigue of nightwork. Overcrowded housing, noisy surroundings and the demands of household routines are all disturbing influences on those who must rest during the day.

In addition, changes in eating habits may lead to gastric troubles, and the limitation of contacts with friends and acquaintances, the difficulty of obtaining recreation and entertainment at unusual hours, the impossibility of participating in beneficial activities, such as evening courses, etc., are all negative factors producing discontent and restlessness, which in turn aggravate the physical and nervous troubles.

When night shifts are worked, different views are held as to whether shifts should be rotated at long or at short intervals. According to one view, it is better to avoid the repeated disturbances caused by frequent rotations and to keep workers on night shift for a spell of some weeks or months in the hope of enabling them to make a

satisfactory adjustment to night work. According to another 
view, so many factors militate against a satisfactory adjustment 
that a long spell of night work is likely to induce cumulative fatigue, 
and rotation should be as frequent as possible. There is evidence 
that different workers react in different ways, but further research 
might well be carried out to establish which type of régime suits 
the majority of workers better.

In industries where continuous operation is not necessary many 
of the advantages of shift working can be secured without night 
work by utilising the double day-shift system—two seven-hour or 
eight-hour shifts between the hours of 6 a.m. and 11 p.m. Not 
all, but many of the most serious inconveniences and disadvantages 
to workers can in this way be avoided. It is true that both the 
early start of the morning shift and the late finish of the afternoon 
shift may make for loss of sleep. On the other hand the possibility 
of shorter hours of work, greater leisure during the day with 
greater opportunities for fresh air and exercise, and the opportunity 
of a long break at the week-end are favourable to health. In the 
United Kingdom such statistical evidence as exists, though it is 
not conclusive, does not show a higher rate of sickness absenteeism 
on the double day-shift system than on ordinary day working.¹

Workers accustomed only to normal day work will often be 
reluctant to adopt shift working even in the form of the double 
day-shift. But there is some evidence that workers’ objections 
to this system are objections rather to the initial changes in habits 
and ways of life necessitated by a switch to a two-shift system 
than to continuing features of the system once they have got used 
to it. The United Kingdom Committee on Double Day-Shift 
Working quoted certain witnesses as saying that workpeople on 
the double day-shift system were in fact reluctant to change back 
to ordinary day work¹; and in the United States, where the system 
is much more familiar, it appears to be accepted as a normal part 
of the life of industrial communities.

If a shift system is introduced against the wishes of the workers, 
many of its potential advantages will undoubtedly be lost. If 
workers are asked to co-operate in the introduction or extension 
of such a system, it is important, in the first place, that the reasons 
for introducing the system should be fully explained to them and a 
fair account given of its advantages and disadvantages; secondly, 
that workers should share in the advantages through higher

¹ Report of the Committee on Double Day-Shift Working, op. cit., p. 15.
wages or shorter hours or both; and thirdly, that with a view to minimizing the disadvantages special attention should be devoted to welfare and transport arrangements for workers.

There are in addition certain things which the community as a whole, as distinct from the employer, may be able to do to facilitate adjustments to shift working. Such adjustments are easier in a community in which shift working is usual than in one in which it is not. They could in some countries be facilitated by appropriate changes in the hours at which shops, cinemas and restaurants are open and public transport operates.

PHYSICAL WORKING CONDITIONS AND WELFARE FACILITIES

Good working conditions and welfare facilities are not only valued for their own sake, but may also promote productivity through their effects both on the physical well-being and on the psychological attitudes of workers.

It is a truism that “work satisfaction” encourages higher productivity, but it is not always appreciated that it also makes it easier for management to introduce changes to secure higher productivity still. Research workers have found—and this is the key to the whole problem—that operatives, shop stewards, and local union officials alike will accept time and motion study, relax rules limiting the number of machines to a worker, allow redeployment of labour, welcome mechanical aids, agree to upgrading of unskilled employees to semi-skilled operations . . . in a “good” factory or workplace. In a “bad” one their attitude can be quite the reverse and regular restrictive practices, backed by the unions, are supplemented from time to time when grievances arise by unofficial go-slow tactics and other hindrances on production.1

A “good” or “bad” workplace in the above quotation means a workplace which is good or bad in terms not only of physical working conditions and welfare amenities but also in terms of industrial relations. Good working conditions and welfare amenities that reflect real concern by management for the requirements of workers as human beings can, however, go a long way towards creating good industrial relations.

The first responsibility of management in regard to working conditions and amenities is to ensure that the requirements of Factories Acts, national insurance legislation and other statutory provisions relating to conditions of work are completely satisfied.

1 “Workers’ Attitude to Productivity”, op. cit., p. 11.
But since legislation can impose only minimum requirements, management has also the responsibility of providing such additional amenities as may be necessary in any particular undertaking to ensure that the health and well-being of workers are adequately safeguarded.

In certain countries, particularly underdeveloped countries, it may be felt that the minimum requirements prescribed by law are not sufficiently rigorous or that the scope of their application is not sufficiently general. Attempts to tighten up legal minimum requirements, or to extend the scope of their application, encounter in many countries difficulties due to the absence of adequate factory inspection services, for which both funds and trained personnel may be lacking. Technical assistance may help countries to overcome the latter deficiency.

No attempt can be made in this report to discuss individually all the topics coming under the heading of working conditions and welfare facilities. So far as physical working conditions are concerned, cleanliness, heating, lighting, ventilation, avoidance of excessive noise, and the provision of adequate space are important. So also are washing facilities and cloakrooms. It is true that many or most human beings appear capable of adapting themselves to physical conditions they at first find disagreeable or distressing (so that, for example, a veteran iron smelter does not complain of excessive heat and a press operator is used to intense noise). This does not however mean that adverse physical conditions are unimportant from the point of view either of job satisfaction or of productivity. It is a common experience, for example, that rates of labour turnover and transfer tend to be high, though chiefly, it seems among workers with short periods of service, in departments where the physical environment is unpleasant.\(^1\)

Since industrial workers spend about half their waking hours in factories, it is also worth taking trouble to make the working environment as attractive as possible. It is hard to imagine a sharper contrast than that between the typical drab, dark, smoke-ridden nineteenth century factory and the model factory of the twentieth century, light and airy, with attractive interior colour schemes, in well-laid-out grounds with lawns, trees and flower

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\(^1\) Cf. Baldamus, op. cit., pp. 18-21 and the sources there cited. Dr. Baldamus does however suggest that the human capacity for adaptation is such that the effects of physical working conditions on workers' incentives to effort are comparatively small. He is not concerned with their effects on workers' capacity to work.
The model factory is not yet typical, but it sets standards that more and more factories are approaching. A number of studies suggest that a cheerful working environment makes, as one would expect, for greater contentment and in some cases for higher productivity than drab surroundings.

Welfare facilities, ranging from rest pauses, rest rooms, refreshment facilities (including canteens), medical services, supply schemes, educational and recreational activities, to housing, pension schemes and other benefits, may all play a part in building up team spirit in the undertaking and a stable, contented and productive labour force. Not all these amenities are, of course, needed in all undertakings. Much depends upon the adequacy of the community services provided. In underdeveloped countries, or in remote parts of more highly developed countries, a special responsibility may rest upon industry to provide amenities that are elsewhere provided through community services.

Special mention may be made of the importance of providing factory canteens in countries where general standards of nutrition are low. It is probable that malnutrition is an important cause of low productivity of labour in underdeveloped countries and among certain sections of the population in more highly developed countries. A nutritional survey conducted in 1947 among male African employees in a South African rubber factory came to the conclusion that—

The high incidence of lesions of malnutrition indicates that most of the workers are in a sub-optimal state of health, which would be expected to have a detrimental effect on their general efficiency as factory workers. Many of the lesions are such as develop over long periods of time and probably date from childhood. The cause of malnutrition of the men cannot be clearly defined, though the home surveys undertaken in the case of a few of the men show a high incidence of inadequate diets. It is suggested that these men have since childhood lived on the wrong type of diet . . . and with little or no subsequent improvement in their diet are continuing to suffer from the ill-effects thereof.¹

The difficulties encountered in providing welfare services are partly technical, partly economic and financial, and partly administrative.

As the mere enumeration of the services and amenities listed above shows, the technical problems that may be encountered in adapting the principles of good working conditions and welfare facilities to the requirements and possibilities of individual under-

takings are too numerous to be discussed in this report. This is a field in which technical assistance to underdeveloped countries may be of value and in which, within more highly developed countries, conferences and exchanges of views and information between firms may enable some firms to learn much from others.

As regards economic and financial difficulties it may simply be pointed out that the relationship between industrial welfare and productivity is at best an indirect one; and that many, though not all, of the services and amenities listed above are costly to provide and cannot be expected to pay for themselves in the short run, and sometimes not even in the long run, through higher productivity. A problem arises, therefore, regarding the degree of priority to be given to improvements in working conditions and welfare facilities as compared, for example, with increases in wages, reductions in the prices of goods produced, increased investment in productive equipment, or increases in distributed profits or reserves. Such priorities can only be settled in the light of individual circumstances. It is reasonable that some part of the gain to society from higher productivity should take the form of better working conditions in the industries and undertakings where productivity increases. So long as further expenditure on improving working conditions and amenities facilitates the actual work for the worker or makes for a more satisfactory social life for the group, such expenditure seems entitled to a high priority; beyond a certain point, however, it becomes somewhat extravagant, and higher wages would probably be preferred.

Given the amount available for spending on welfare and amenities, problems also arise regarding the relative importance of different types of welfare services. These problems are more likely to be solved in a manner acceptable to workers if welfare services are financed out of funds that workers’ representatives have some responsibility for administering.

This leads to the question of administrative difficulties. When welfare services have been introduced, it has not always been recognised as desirable to associate the workers themselves with the administration of such services. Indeed, to some people the

1 There are, however, important services of which this is not true: for example, a canteen can pay for itself, apart from the capital outlay; and a contributory holiday fund may serve a useful purpose even if the company makes no financial contribution.

2 One undesirable consequence of a wage freeze is that it may encourage competition between employers to take such forms as the provision of more and more luxurious washrooms.
very term "welfare" has a paternalistic sound. Yet participation by workers' representatives in the administration of welfare services, through membership of appropriate committees, not only gives workers a say in matters of direct concern to them but can also serve as a valuable training, helping workers' leaders to acquire an understanding of administrative problems and a realistic and responsible outlook which may, in turn, assist them to understand the point of view of management and to co-operate effectively with it on other matters more directly related to the achievement of higher productivity. The French law on works committees deals at length with their functions regarding welfare services. A pamphlet issued by the British Institute of Personnel Management suggests that—

It is a fundamental principle that employees should have the right to elect representatives who, jointly with the management, share the responsibility of administering services which are run for their benefit. . . . Both in the administration of funds and in the running of social or recreational schemes, management should want to recognise the interests of the employees and obtain decisions which are the result of joint representation round the committee table.¹

This would seem to be important not only in the more highly developed countries but also in underdeveloped countries, where there is an urgent need to increase the number of workers with the kind of training and the qualities of leadership that can be acquired through such participation. The resolution concerning the promotion of facilities for workers' welfare in Asian countries unanimously adopted at the I.L.O. Asian Regional Conference held in Ceylon in 1950 recognised that—

The workers should have the right to co-operate in the administration of the welfare facilities provided in or in connection with undertakings by such means as representation on welfare committees or other bodies whose functions include this responsibility.²

Administrative difficulties may often be eased by appointing welfare officers, whose duties range from responsibility for the supervision and co-ordination of most welfare services in the undertaking to dealing with purely personal and family problems.

The appointment of a welfare officer seems not only to provide a useful link between management and workers on all welfare matters, but also to introduce a personal touch, which can sometimes be of greater importance than formal arrangements, however well organised and managed they may be.

As a means of informing workers of progress and developments in the undertaking, stimulating their interest in such developments, providing a permanent record of the welfare services and benefits available and fostering interest in social and recreational activities, the usefulness of works magazines and similar news services, in addition to any other channels of communication that may be used, would seem to have been proved.

**Industrial Safety and Health**

The promotion of safety and health is an end in itself; but it is also an important means to higher productivity.

Industrial accidents not only cause suffering but also impede production; many accidents cause lifelong suffering and have catastrophic effects on production. In modern industry, with its expensive equipment and carefully planned flow of operations, a serious accident is extremely costly—it damages equipment, stops work and may take workers out of production for a long time, if not for ever. Moreover, some accidents that result in only minor injuries, or no injury at all, can be very harmful to production. The sum total of injuries to persons, damage to property and economic loss to communities caused by industrial accidents is enormous, but at the same time very largely avoidable.

The protection of the worker against injury arising out of his employment is not, however, a simple matter. While the broad principles of accident prevention may be the same for all industries and all countries, the detailed practical application of these principles varies enormously from industry to industry, and may vary considerably from country to country. Factory industries, steel works, sawmills, cotton mills and chemical works, to mention only a few, all have problems quite their own. Differences in national conditions introduce further complications in the promotion of accident prevention in the various industries. Techniques must be adapted to mentality, climate and educational level, etc.; and measures that are advisable in some conditions may not be so in others. Even in a single industry the amount and complexity of technical equipment to be made safe may be very considerable.
Voluminous codes of safety regulations have been issued for steam plant, electrical installations and woodworking machinery, for example. Fire prevention, machine tools, hoisting appliances, gas cylinders, and explosive and inflammable substances are also the subjects of many detailed regulations.¹

In recent years the human element in accident causation has received increasing attention, and has been found to be even more complex, and perhaps even more important, than any other. Some means of dealing with it are seen in the thousands of works safety organisations now in existence, in works medical services, in psychological research institutions, safety training institutions, safety education courses, safety propaganda activities and so forth.

The problems of accident prevention in industry fall into three broad classes, which may be called technical, psychological and medical. Examples of technical problems are those involved in the design and construction of factory premises, the safeguarding of machinery and other factory equipment, the devising of precautions against harmful gases and dusts, and the safeguarding of electrical installations.

Psychological problems, which have more recently come to the fore, are those directly concerned with the human element in accident causation and include education and training in safe habits of work, and also in supervision and management; psychological methods of vocational guidance and selection; and means of dealing with the workers' mental and emotional troubles. It may seem a far cry from the safeguarding of shafting to the treatment of neuroses, but the relationship between neuroses and accidents is neither imaginary nor negligible. Some years ago the Medical Research Council of the United Kingdom reached the disquieting conclusion that some 10 per cent. of factory workers suffer from definite and disabling neurotic illness and that a further 20 per cent. suffer from minor forms of neurosis²; it is well known that persons who are ill are more liable to accidents than those who are well.

Medical methods of accident prevention aim, among other things, at eliminating the physically unfit from occupations unsuit-

¹ Attention is drawn in this connection to I.L.O.: Model Code of Safety Regulations for Industrial Establishments for the Guidance of Governments and Industry (Geneva, 1949).
able and therefore particularly dangerous for them—and for their workmates.

The means employed in different countries to grapple with these three types of problem may be classified as follows:

1) legislation—the laying down of enforceable rules concerning the design, construction, maintenance, inspection, testing and operation of industrial equipment, duties of employers and workers, training, first aid, etc.;

2) standardisation—the laying down of official, semi-official or voluntary rules for the safe construction of certain industrial equipment, personal protective devices, etc.;

3) inspection—the means of ensuring that official rules are obeyed;

4) technical research—the investigation of the qualities of harmful materials, study of machine guards, testing of respiratory protective devices, investigation of the most suitable materials and designs for hoisting ropes and other hoisting equipment, etc.;

5) medical research—the investigation of the physical characteristics conducive to accidents, etc.;

6) psychological research—the investigation of the psychological characteristics conducive to accidents, etc.;

7) statistical research—to ascertain what kinds of accidents occur, in what numbers, to what types of people, from what causes, etc.;

8) education—the teaching of safety in engineering colleges, trade schools, apprentices' courses, etc.;

9) training—the instruction of workers, and especially new workers, in safe practices, etc.;

10) propaganda—a kind of education, but more in the nature of an emotional appeal than systematic instruction;

11) insurance—the application of financial stimuli to promote accident prevention.

The machinery employed to apply these techniques is complex: it usually includes both governmental and private agencies; and it is linked vertically from the individual factory to a national
organisation for a single industry, and horizontally from factory to factory in the same district and from industry to industry in national or large regional areas.

The extensive treatment given to safety questions in practically all the reports of the Anglo-American Council on Productivity is a measure of the importance of industrial safety in relation to productivity. It was a common experience of these teams that, whereas legal safety regulations (relating, for example, to the guarding of machines) were more advanced in the United Kingdom than in the United States, more was done in the United States to promote "safety consciousness", to educate workers in the particular hazards of their jobs and thus to get them to accept responsibility for avoiding accidents.

This difference between American and British practice is well illustrated in the following passage from the report of the pressed metal productivity team:

The American approach to the problem of safe working in press plants is fundamentally different from our own. The greatest emphasis is on making the operator safety conscious, and training is almost entirely directed to that end. Safety regulations exist and vary from state to state, but in no case are they as clearly defined or as stringent in their requirements as in Britain. . . . In many plants there is a Safety Committee which meets regularly to promote safety in the plant, and, in particular, the safe handling of stock and equipment. A great amount of safety propaganda is undertaken, and the rudiments of safety are usually imparted to new operators before they are allowed to work under production conditions. . . . All this operator training and propaganda is effective. For example, in one large plant visited the bulletin board showed 273 consecutive days of working, including 2,300,000 man-hours, without a single "lost-time" accident.¹

It is clearly desirable that vigorous measures to promote safety should be regarded as an essential part of any programme to raise productivity. Experience has shown that the attitude of top management towards accident prevention is of the highest importance, and that little real or lasting success can be expected unless the interest of management is genuinely active and sustained. In order to co-ordinate and focus responsibility for safety work it has been found desirable in undertakings of sufficient size to appoint a full-time safety officer and in smaller undertakings to designate an officer to assume responsibility for safety work and regularly to devote a part of his time to discharging this duty. An important part of the work of such an officer is to promote "safety conscious-

ness" throughout the undertaking by all available means; in this task workers' representatives, through membership of works safety committees and in other ways, can play an extremely important part. The organisation of safety competitions between departments and undertakings has proved a valuable means of stimulating and maintaining the interest of workers in safety precautions.

Ill-health, like industrial accidents, is another factor that keeps productivity far below the levels it might attain. It is the cause of a large amount of absenteeism, and in addition adversely affects the output of a number of workers who are not so ill as to remain away from work.

The health of industrial workers, like that of other sections of the community, depends largely upon general standards of nutrition and upon the adequacy of public health services, but it also depends upon their conditions of work. The protection of the health of workers in their places of employment was discussed at the 36th Session of the International Labour Conference in 1953. The Conference adopted a Recommendation on the subject which urged, inter alia, that national laws or regulations should contain special provisions regarding the medical examination of workers employed in occupations involving special risks to their health, and should require the notification of cases and suspected cases of occupational diseases. It was also recommended that first-aid and emergency treatment in case of accident, occupational disease, poisoning or indisposition should be provided in places of employment. A number of technical measures to be taken by competent authorities or by employers to control risks to the health of workers at the workplace were also recommended.

**Absenteeism and Labour Turnover**

High rates of absenteeism and labour turnover involve heavy costs for industry and are in some plants a major cause of low productivity. It is true that when wages do not have to be paid to an absentee the loss of his or her output may appear to be offset. This appearance is deceptive, however, for in modern industry the overhead costs of idle equipment and unused services of salaried staff are heavy. There is also the disruption of teamwork, which may, in assembly industries, reduce output by more than an absentee's normal contribution.¹

If workers who leave are not immediately replaced, their
departure involves costs similar to those of absenteeism. Even
if they are immediately replaced, the firm still encounters costs of
training newcomers and probably also of low output, spoiling of
materials and imperfect participation in teamwork during the
period of training.¹

The action required to control absenteeism and labour turnover
falls into three stages. First, with a view to determining the
magnitude of the problems, a distinction must be drawn between
voluntary and involuntary absenteeism and labour turnover;
secondly, the causes of voluntary absenteeism and labour turnover
must be investigated; and, thirdly, there is the question of what
can be done to remove these causes.

In order to determine the magnitude of the problems it is
essential to keep records distinguishing the reasons for absenteeism
and labour turnover. The value of such records would be much
increased if standardised definitions and procedures were agreed
upon, so as to permit accurate inter-firm, inter-industry and inter-
national comparisons.²

Absenteeism (which is usually taken to mean only absence at a
time when workers would normally be expected to be present, and
which therefore does not include vacations or absences due to
accidents in the plant or other company reasons) may be divided
into certified sickness absence³, uncertified sickness absence³,
absence due to domestic responsibilities, absence due to uninten-
tional lateness, and voluntary absenteeism. Labour turnover
may be divided into turnover resulting from deaths, retirements,

¹ Up to a point, labour turnover indicates the mobility between places
and jobs that is so essential to an efficient economy. But labour turnover
may rise far above this point. That this may happen in centrally planned
as well as in private-enterprise economies is shown by the fact that in the
U.S.S.R., where unemployment had been overcome, excessive labour turnover
emerged and controls and penalties had to be imposed on "quitting". (Cf.
Alexander Baykov: The Development of the Soviet Economic System, National
Institute of Economic and Social Research, Economic and Social Studies V
(Cambridge University Press, 1950), pp. 361 ff.) In Czechoslovakia, also,
high rates of labour turnover have been deprecated in official statements.

² One technical hitch that often arises in comparing records is due to
variations in the number of days a worker can be absent without showing
cause before his name is taken off the books. In firms where this period is
long, the apparent rate of absenteeism is inflated. Professor Sargent Florence
suggests that "possibly a week should be the limit after which workers giving
no satisfactory reasons, such as sickness, would normally be considered to
have left and to be a case of 'labour turnover'", (op. cit., p. 38).

³ Including absence due to accidents outside the plant. Absence due to
accidents in the plant is also sometimes regarded as a form of absenteeism.
As has been said, there is no standard terminology in this field.
layoffs due to reduction of staff, discharges and voluntary separations. While there may sometimes be scope for action to reduce the incidence of involuntary absenteeism and involuntary turnover (improved physical working conditions and health services may, for example, reduce sickness rates) it is voluntary absenteeism and voluntary separations that constitute the essence of the problem to be discussed in this section.

Investigation of the reasons for these phenomena is facilitated if records are kept in such a way that the total figures both for voluntary absenteeism and for voluntary separations can be broken down without too much trouble according to the age, sex, marital status, length of service, department, occupation and wages of the workers. Comparisons of rates of voluntary absenteeism and voluntary separations among workers grouped under the above headings will often be illuminating.

Where rates of voluntary absenteeism or of voluntary separations are unsatisfactory, the reasons may be economic (e.g., dissatisfaction with wages), or institutional (e.g., dissatisfaction with the industrial or human relations in the plant or the type of supervision provided), or occupational (dissatisfaction with the actual nature of the work). While measures to improve human relations in the undertaking and to enlist the co-operation of workers in checking high rates of absenteeism and turnover have often yielded good results, three recent studies by the Faculty of Commerce and Social Science in the University of Birmingham suggest that occupational factors are a good deal more important than has commonly been thought.\(^1\)

The true reasons for absence and voluntary separations are often difficult to get at. Further light may be thrown on the extent of and reasons for voluntary absenteeism by comparing absentee rates on different days of the week. In two English companies such a comparison showed a very striking pattern of variation characterised by high absenteeism on Mondays and a general fall of absentee rates throughout the week towards Friday. This pattern was repeated throughout the year, except at holiday times.\(^2\) It has been suggested that where a pattern of this kind is found the absentee rate on the day of best attendance, though it

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\(^1\) Baldamus, op. cit.; J. Long: Labour Turnover under Full Employment; and H. Behrend: Absence under Full Employment; all published in 1951.

\(^2\) Behrend, op. cit., pp. 42 ff. and 127. Over the period covered by the study there was practically no unemployment. Data for two factories in Germany, where there was unemployment, showed no evidence of Monday absenteeism.
may contain some voluntary absenteeism, represents a realistic approach to the concept of a practically attainable minimum absentee rate.\(^1\)

In the study in which this suggestion is made a “Blue Monday” index was calculated for two companies, showing the number of deficient attendances on Mondays as compared with Fridays. The weekly attendance pattern and the “Blue Monday” index were found to vary considerably for different occupations, departments and factories. It is stated that—

Monday absenteeism appears to be a phenomenon of general social incidence in many English factories. It is characteristic not only of individual but of group behaviour. In many departments the “Blue Monday” pattern was shown by more than 25 per cent. of the workers, and in no case was a high “Blue Monday” index due to the action of only one or two individuals.\(^2\)

No close relationship could be discovered between the “Blue Monday” index and working conditions, size of departments, physical effort required, wages or age. Supervision appeared to be only a secondary factor, the type of work being the prime determinant of the “Blue Monday” index. It is stated that this index “appeared to vary with the psychological strain involved in the operation, rising as the strain increased.”\(^2\) Further research into methods of measuring the psychological strain involved in different operations is, however, required. The strength or weakness of the “traction” experienced\(^3\) appears to be one important element influencing the degree of psychological strain. There is, however, no reason to emphasise this element to the exclusion of others. More generally, Behrend suggests that “if Monday absenteeism is a sign of attitude to work, workers with a ‘Blue Monday’ attendance pattern can be identified as workers with an unfavourable attitude to work, and causes of dissatisfaction can be discovered by interviewing these workers.”\(^2\)

High rates of voluntary labour turnover have often been regarded as evidence of poor-quality management. The Birmingham studies suggest that this is an incomplete explanation. Investigations in two companies point to the existence of a connection between the psychological strain involved in different kinds of

\(^1\) Behrend, op. cit., p. 46.  
\(^2\) Ibid., p. 129.  
\(^3\) That is to say, the sense of being drawn or pulled along by the inertia inherent in a particular activity. See p. 143 above.
work and the rate not only of voluntary absenteeism but also of labour turnover among different categories of workers.¹

The evidence collected so far is sufficient to advance the statement that type of work is of greater importance to the study of the human factor in industry than has been thought recently. As to labour turnover in particular, it is clear now that any investigation which does not pay attention to occupational differences remains essentially incomplete. But this does not mean that the conventional efficiency-hypothesis must be discarded altogether. It is still possible, and even likely, that a residual factor, "efficiency of personnel management", remains as a separate determinant of turnover. However, if this is to be assessed accurately, it will be necessary to compare series of identical or similar jobs, in respect of turnover, in different factories and departments.²

Until the reasons for high rates of voluntary absenteeism or turnover have been discovered, action designed to reduce such rates is bound to be of a hit-or-miss character. Once the reasons have been discovered the appropriate line of action will often suggest itself. The reasons will not, of course, be the same in all cases; but, if the conclusions to which the Birmingham studies point are accepted, it seems that it would often be worth while for managements suffering from high rates of voluntary absenteeism or turnover to go to a good deal of trouble to ascertain what features of the work done in the undertaking are particularly disliked, and to devise adjustments that would, so far as possible, eliminate or modify these features.

¹ BALDAMUS, op. cit., pp. 59 ff.
² Ibid., p. 69.
PART III

PRACTICAL METHODS OF INCREASING PRODUCTIVITY
CHAPTER VII

CONCLUSIONS OF THE MEETING OF EXPERTS ON PRODUCTIVITY IN MANUFACTURING INDUSTRIES

The Meeting of Experts on Productivity in Manufacturing Industries already referred to in the present study was held under the auspices of the I.L.O. in Geneva in December 1952. It included 16 experts from 13 countries and was also attended by representatives of the Governing Body of the International Labour Office, a representative of the United Nations and observers from the Organisation for European Economic Co-operation, the International Committee of Scientific Management, the International Confederation of Free Trade Unions, the International Federation of Christian Trade Unions and the International Federation of Business and Professional Women.

The Meeting unanimously adopted the conclusions set out below.

1 The following experts attended the meeting:

Mr. Erik Bengtson (Sweden): Formerly Managing Director, Boliden Mining Company.

Dr. J. A. Berger (Netherlands): Chairman, National Committee on Methods of Increasing Productivity; Chairman, Board of Conciliators.

Mr. Emile Boursier (France): Secretary-General, Union of Metallurgical and Mining Industries.

Mr. W. F. Brazener (United Kingdom): Managing Director, The Mint, Birmingham, Ltd.

Dr. P. H. Cook (Australia): Assistant Secretary (Employment), Department of Labour and National Service; author of *The Productivity Team Technique* (Tavistock Institute of Human Relations); Lecturer in Industrial Administration, University of Melbourne.

Mr. J. Crawford (United Kingdom): President of the National Union of Boot and Shoe Operatives.

Mr. C. P. Dave (Pakistan): Assistant General Secretary, All-Pakistan Confederation of Labour.

Mr. R. Faupl (United States): International Representative, International Association of Machinists; Labour Member of Special Panel on Incentive Regulations for Increased Productivity; alternate Labour Member on the Review and Appeals Committee of the Wage Stabilization Board.

Mr. John C. Gebhart (United States): Director of Research, National Association of Manufacturers; Chairman of the Business Research Advisory Committee to the Bureau of Labor Statistics of the U.S. Department of Labor.

[Footnote continued overleaf.]
INTRODUCTION

1. In the broadest sense, the problem of raising productivity is the problem of making more efficient use of resources in general —of using them to produce as much wealth as possible at the lowest possible real cost.

2. Higher productivity provides opportunities for raising the general standard of living, including opportunities for—
   (a) larger supplies both of consumer goods and of capital goods at lower costs and lower prices;
   (b) higher real earnings;
   (c) improvements in working and living conditions, including shorter hours of work; and
   (d) in general, a strengthening of the economic foundations of human well-being.

3. In order to ensure that higher productivity does in fact lead to higher standards of living, it is of the utmost importance—
   (a) That the benefits of higher productivity should be equitably distributed among capital, labour and consumers.
   (b) That the demand for goods and services should be maintained at a sufficiently high level and that adequate measures should be taken to prevent higher productivity from leading to unemployment. In countries where employment opportunities are limited by scarcity of capital, special attention needs to be devoted to the problem of ensuring an adequate rate of capital formation.

Dr. George V. Haythorne (Canada): Director, Economics and Research Branch, Department of Labour; Chairman, Interdepartmental Committee on the Measurement and Analysis of Productivity.

Dr. H. Knolle (Federal Republic of Germany): Ministry of Labour.

Mr. Werner Rasmussen (Denmark): Danish Productivity Council; Danish Representative on the Productivity and Applied Research Committee of the O.E.E.C.

Mr. René Richard (France): Member of the Economic Council; Director of the French National Productivity Committee and of the French Association for the Increase of Productivity; Founder President of the Trade Union Productivity Study and Research Centre; Secretary-General of the National Federation of Engineers and Senior Supervisory Staff (Fédération nationale des ingénieurs et cadres supérieurs de la C.G.T. - Force ouvrière - F.N.I.C. - F.O.).

Mr. S. Sporsin (Brazil): President of the Union of Master Craftsmen and Supervisors in the Spinning and Weaving Industry of the state of São Paulo; Teacher and Head of the Advanced Technical Training School for Spinners and Weavers belonging to the Union.

Mr. R. M. Shah (India): Controller of Stores, Bombay Electric Supply and Transport Undertakings; formerly industrial and business consultant.

Mr. Alfred Walther (Switzerland): Engineer; Professor of Business Economics in the University of Berne.

Dr. Haythorne served as Chairman of the Meeting.
These are matters both of social justice and of economic necessity; failure to distribute widely the benefits of higher productivity and to maintain demand and employment would mean that the conditions for continuing increases in productivity would not exist.

4. It is also of the greatest importance that there should be a free and strong trade union movement within a régime which ensures fullest freedom for the exercise by it of collective bargaining rights on an equal footing with employers and/or their organisations.

5. The achievement of higher productivity calls for action on the part of governments, employers and workers. Governments have a responsibility for creating conditions favourable to higher productivity by promoting a balanced programme of economic development, and by adopting appropriate economic and social policies concerning such matters as foreign trade, capital formation, monopolistic practices, the assurance of adequate supplies of raw materials, monetary and fiscal conditions, the development of efficient employment services, health, housing, scientific research and education. While primary responsibility for action to raise productivity in individual undertakings rests with management, the active co-operation of workers and their representatives is indispensable. Success in obtaining the co-operation of workers in measures to raise productivity is itself a test of the quality of management, but depends also upon trade union leadership.

6. Action designed to raise productivity may encounter resistance to change on the part of any or all of the various groups working in an undertaking. Such resistance is one of the major problems in the field of productivity, and action to overcome it must be based on a careful examination of the particular situation and an understanding of the reasons for such resistance.

7. For the purpose of this statement of conclusions, the term "productivity" is used throughout to signify the ratio between output and input in a plant, an industry or an economy as a whole. This ratio can be expressed in terms of different input factors, such as labour, capital or raw material. For several reasons, including greater availability of manpower data, labour (man-hours, man-days or man-years) is frequently used as the denominator in this ratio. Although it has limitations, this ratio has much value for practical purposes. But the changes in productivity revealed by this ratio may be, and often are, influenced by changes in machinery, equipment, plant organisation and raw materials, as well as by changes in the quantity and quality of labour. It is highly important in analysing productivity changes to keep all such factors in mind, since they all affect final cost figures.

8. Statistical measurements and comparisons of productivity can be of great value as pointers to the action that may need to be taken in order to raise productivity in particular plants or
industries, and attention is drawn to the desirability of developing and making use of uniform techniques for the measurement of productivity.

9. Conditions vary greatly from country to country, from industry to industry and from plant to plant. While the conclusions which follow therefore apply in varying degrees in different circumstances, it is important that in every case all practicable action should be taken to raise productivity.

**General Considerations**

10. Higher productivity calls for concerted efforts on the part of members of all groups engaged directly or indirectly in production. Such efforts may require in some cases far-reaching changes in the attitudes of all concerned. Full co-operation on the part of all groups can be expected only in a society which accepts principles of social justice, and in which it is recognised that the fundamental purpose of industry is to serve the needs of society as a whole.

11. Where machinery exists for co-operation between employers and workers, it should be used to the fullest possible extent for the purposes of promoting higher productivity. Where such machinery does not exist in a given industry, consideration should be given to its establishment at the national, regional or plant level.

12. Where it is possible and appropriate to do so, there are advantages in discussing at the level of the industry, or at regional levels, such matters as arrangements for the sharing of the results of increased productivity and the safeguards to be applied for the well-being of workers and the continuing efficiency of the undertakings in the industry, since such discussions may make possible some measure of uniformity in the application throughout an industry of techniques for raising productivity.

13. In order that, wherever possible, measures taken to promote higher productivity shall have the support and understanding of workers and their representatives, appropriate arrangements should be made at the level of the undertaking, by which—

   (a) if general principles have been discussed at the level of the industry or at the regional level, as envisaged in paragraph 12 above, their application in the particular undertaking should be examined, and opportunity should be given for detailed explanation, comments and suggestions;

   (b) where no machinery exists at the industry or regional level, matters such as those envisaged in paragraph 12 above should be examined, explained and discussed at the plant level.

14. Representatives of employers and workers and/or their organisations should be consulted by governments on national
policies designed to promote higher productivity. Consideration should be given to setting up national productivity centres or similar organisations, where none yet exist, to serve as centres of information and research, and in certain circumstances to coordinate national efforts to promote higher productivity; these should be under the control of boards or committees on which employers' and workers' organisations are equally represented. Co-operation between national productivity centres or productivity committees on matters of common interest should also be encouraged. Where it is appropriate, consideration should be given to the establishment of joint committees, or centres for research and information, for the promotion of productivity in individual industries.

15. The share of workers in the benefits of higher productivity may take the form in part of higher wages, in part of lower prices for the goods produced, and in part of better working conditions, including shorter hours, social services, and workers' housing. Increases in wages and improvements in working conditions made possible by higher productivity should be determined, wherever possible, by collective agreements. The manner in which the increased wealth yielded by higher productivity is devoted to providing these various benefits will depend upon the varying circumstances of different countries. While the workers directly connected with increases in productivity should benefit, consideration should also be given to workers in other industries where an increase in productivity may at the moment not be possible to the same extent. Social equity demands that consideration should also be given to industrial and social groups who may for various reasons not be in a position to press their claims. Such groups include supervisory, technical and other staff.

16. In taking measures to increase productivity in his undertaking the employer should take into account as far as is practicable the human problems raised by technological change.

17. It is desirable that government research and operating agencies in the labour field should have the closest possible contacts both with industry and with vocational and other training establishments, and should be in a position to collect and analyse such statistical and other data as will make possible reliable studies of trends in the employment situation on which estimates of available supplies of manpower, of future requirements for different kinds of skill, and of the need for labour mobility can be based.

18. Improvements in equipment and techniques change the nature of employment opportunities and may make it necessary for some workers to change their jobs. Measures to increase productivity should therefore be accompanied by measures to protect the interests of any workers who may lose their jobs or be threatened with loss of jobs. In particular—
(a) Governments should accept continuing responsibility for the implementation of policies designed to maintain high and stable levels of employment.

(b) Measures should be taken, in accordance, where possible, with agreed procedures, to keep to a minimum the number of workers who may lose their jobs and to assist the re-employment of displaced workers. Such measures should include—

(i) Advance planning by employers of changes in industrial processes or equipment, and advance notification of displacements expected to result therefrom. Consideration should also be given to reducing or suspending new recruitment with a view to retaining redundant workers until sufficient jobs become available for them as the result of normal labour turnover.

(ii) The granting by employers of preference to displaced workers in the filling of vacancies, with due regard to efficiency, good conduct and seniority.

(iii) The provision, where appropriate, of vocational guidance, training and retraining facilities.

(iv) Improvements, where necessary, in employment service organisation, designed to ensure that information regarding suitable vacancies is promptly made available to all who need such information.

(v) Measures to promote the geographical mobility of labour, such as, where appropriate, removal grants and programmes for the construction of workers’ houses.

(c) Measures should be taken through unemployment insurance schemes or in other ways to protect the living standards of workers who may lose their jobs.

19. Although considerable progress has been made in recent years, there is an urgent need for further experiment, investigation and research into the influence of the various factors affecting productivity. This work may be undertaken, according to circumstances, on an international, national, industry or plant basis, and may require close collaboration between people drawn from various backgrounds and scientific disciplines. Irrespective of the auspices under which such research is conducted, it should be planned with the full co-operation of representatives of both employers’ and workers’ organisations. This co-operation should facilitate the acceptance and application of the results of research.

20. In order that the most effective means of increasing productivity should be made widely known and applied where practicable, it is essential that there should be a free exchange of information between countries, industries and undertakings. In addition to the use of the usual media of communication—newspapers, periodicals and other publications, films, filmstrips, etc.—the increasing practice of exchanging information by means of personal
contacts should be encouraged. Attention is drawn particularly
to the value of study visits of groups or teams representative of
the undertaking, industry or country concerned.

21. In countries which are underdeveloped either economically
or in terms of industrial relations, considerable help in the introduc­
tion of techniques for raising productivity, including many of those
referred to in this statement of conclusions, can be given by the
International Labour Organisation, other specialised agencies and
the United Nations under the provisions of their Expanded Pro­
gramme of Technical Assistance. It is accordingly recommended that
in seeking to increase productivity in their manufacturing indus­
tries, those countries should make the fullest use of this assistance.

MEASURES TO PROMOTE PRODUCTIVITY
WITHIN UNDERTAKINGS

22. Subject to what has been said above concerning action by
governments and action at the level of the industry, the raising
of productivity depends primarily on action taken at the level of
the undertaking.

23. Primary responsibility for action to raise productivity in
individual undertakings rests with management.

24. No effort to increase productivity can succeed without
good relations between management and the workers concerned
and their representatives, and measures should be taken by them
to promote such relations.

25. Increased productivity in the undertaking calls for action
in three main fields—
organisation and control of production;
personnel policy; and
plant and equipment.
The action to be taken in these fields will vary in accordance with
the economic position of the undertaking. Even when it is not
possible to make substantial changes in equipment, it will always
be possible to use fully and efficiently the means available, on the
one hand, for the continuous improvement of organisation and
methods and, on the other hand, for the active participation of
all personnel in efforts to increase productivity.

Organisation and Control of Production

26. Every effort should be made to achieve a greater degree of—
(a) simplification: the process of reducing the number of types
and varieties of product made;
(b) standardisation: the process of organising agreement on (1)
a standard for a particular product, range of products, or procedure,
and (2) the application of that standard; a standard is a definition with reference to performance, quality, composition, dimensions or method of manufacture or testing;

(c) specialisation: the devoting of particular productive resources exclusively to the manufacture of a narrow range of products.¹

27. The raising of productivity requires an examination of the general organisation of the undertaking and a clear definition of the lines of authority and responsibility. The advantages of adopting a form of organisation which permits specialisation of functions, together with adequate co-ordination, have been recognised increasingly in large establishments and organisations.

28. Attention should be given to work-study techniques, including method study and work measurement, as a means of improving the organisation of work and simplifying processes and, in suitable cases, as a basis for systems of payment by results. Care should be exercised in interpreting the results obtained by these techniques. The agreement and participation of workers are essential for the successful application of such techniques.

29. Careful attention should be devoted to production planning and control in order (a) to ensure that materials and component parts are available when and where they are required; (b) to reduce as much as possible the time when machines are idle; and (c) to ensure that workers are neither overworked nor left idle.

30. In applying work study and production control every effort should be made to simplify works processes and thereby to effect economies in labour, equipment and materials.

31. Design and planning staff should be kept informed of the cost and performance of the various items of equipment and materials used, so that they may be better able to devise the most economical methods and tool designs. There is often scope for closer co-operation with users when products are being designed.

32. There should be the closest co-operation and interchange of information between the departments responsible for design, planning and production, in order to establish maximum efficiency in labour utilisation and plant installation.

33. In many undertakings it will be found highly advantageous to establish a development department. This should have constantly in mind the possibility of improvements in plant design and operation. It should co-ordinate any suggestions and ideas for improving works processes. It has special opportunities in the fields of machine control and the flow of material through the undertaking.

34. Careful attention should be devoted to costing and budgetary controls designed to provide management with (a) accurate information about unit costs; (b) the means to control expenditure properly and to correct failings and shortcomings by comparing results actually achieved with budget forecasts; and (c) guidance in planning for the future.

35. Special attention should be given to raw materials and to marketing policies. In particular, reorganisation of the methods of distribution and a study of markets may be necessary in order to ensure an outlet for increased production.

36. Undertakings can operate at optimum efficiency only when regular work schedules can be maintained. The following points are emphasised:

(a) Governmental policies designed to maintain high and stable levels of income and employment can play an important part in promoting a fuller utilisation of capacity.

(b) It is of the highest importance that public authorities should avoid unnecessary irregularity in the timing and placing of their orders.

(c) Manufacturers may sometimes be able, through marketing policies or price differentials, or in other ways, to reduce seasonal and other fluctuations in the demand for their products.

(d) Better planning of production schedules may also help to reduce irregularities in production arising from seasonal and other fluctuations.

37. In cases where adequate markets exist, where supplies of materials and of labour are sufficient and where overhead costs represent a substantial proportion of total costs of production, the possibilities of increasing production by working a larger number of shifts should be studied.

38. In the establishment of new plants or branches, careful consideration should be given to the relative advantages, from the point of view of productivity, of alternative localities. Factors requiring attention include the availability of different kinds of labour, transport, power and raw materials. In some countries regional or national planning makes an important contribution to a sound and balanced location of industry.

Personnel Policy

39. In order to improve the application by executive and supervisory staff of sound policies and efficient techniques concerning personnel matters within an undertaking, management should consider the appointment of qualified personnel officers and, where the size of the undertaking permits, the organising of personnel departments or services.
40. With a view to ensuring that the most effective use is made of the services of all members of the working force in the establishment and that employees are engaged on jobs which they can perform efficiently and with satisfaction to themselves, attention should be given by management to improving the methods used for the selection and placement of members of the undertaking and the follow-up procedures designed to review their progress and adjustment to their jobs.

41. The practice of giving brief induction courses or orientation courses to new employees in industry, designed to give them an understanding of the undertaking in which they work and of their own place in it, is spreading and is to be commended.

42. Foremen and supervisors can make specially important contributions to higher productivity. They constitute the principal link between higher management, scientists and engineers on the one hand and operatives on the other. It is of fundamental importance that they should be kept informed of, should understand and should be able to explain the policies and programmes of higher management. Steps should be taken to ensure that they are carefully selected and are fully represented, either directly or through their organisations, in any machinery which is established in the undertaking.

43. In order to ensure that skilled workers are not required to spend any considerable proportion of their time on work for which their special skills are not required, attention should be given to the possibility of servicing such workers more effectively, whether by mechanical means or by providing more unskilled assistance.

44. Wherever there is a shortage of skilled labour, attention should be given to the proper training of skilled workers through apprenticeship or other bona fide training programmes and to the possibility of simplifying work methods with a view to increasing the proportion of work which can be done by semi-skilled operative labour. At the same time opportunities should be provided for non-skilled workers to acquire the skills needed for the performance of such operations.

45. Education and vocational training can make a major contribution to higher productivity. Special attention is drawn to the following points:

(a) The organisation of educational and vocational training activities requires foresight in estimating both present and future trends in requirements for different categories of workers and different kinds of skill.

(b) Management's capacity to discharge its responsibilities for raising productivity can be increased by means of appropriate training designed to promote "productivity consciousness" based
on a thorough understanding of the basic principles and the social objectives and implications of techniques for raising productivity.

(c) Much of the initiative for making specific proposals and for applying specific measures for raising productivity must come from scientists, engineers, technicians and industrial relations and personnel officers employed in industry. There is an acute shortage of persons trained in the principles and techniques of industrial engineering and organisation, and a great need for expanding facilities for their training. In this connection universities and technical colleges can make an important contribution and should, where necessary in order to meet this need, introduce or expand courses in industrial organisation and industrial engineering.

(d) There is growing recognition of the cardinal importance of adequate training for foremen and supervisors not only in their technical and administrative duties but also, and perhaps especially, in the principles of human relations, since it is of the highest importance that there should be mutual confidence and friendly relations between supervisors and their personnel.

(e) Systems of basic training for skilled workers should not be unduly specialised. They should aim at imparting general information and cultivating general interests and abilities of value in a variety of actual working conditions. Systems of basic training should be supplemented and completed by other types of training designed to develop specialised skills and to facilitate the promotion of workers to positions of greater responsibility and skill.

(f) The necessity for training semi-skilled workers, as distinct from skilled workers, is more and more widely recognised. Experience has shown that the time required to learn a job can often be shortened, the number of failures reduced and the process of learning converted into a more satisfying experience if adequate instruction for semi-skilled workers is provided.

(g) Special training programmes may be needed in undertakings or industries where measures to raise productivity are in process of application, in order to enable workers to adapt their skills to changes in production techniques or equipment or to facilitate the re-employment of displaced workers or workers threatened with displacement.

(h) It may be desirable, particularly for establishments which are not familiar with modern techniques for increasing productivity, to put into operation programmes to increase productivity which require training in these techniques in the first place for supervisory personnel and subsequently for all personnel; for this purpose it will be necessary to give special training to selected members of the supervisory personnel who will be responsible for the programme. It is important that the action of those responsible for such programmes be effectively supported by management. It is recommended that such programmes be co-ordinated at the industrial or regional level. Use may be made in this connection of the centres or other similar agencies referred to in paragraph 14, where these exist.
(i) Where industrial consultants are employed in an undertaking to introduce work-study or industrial engineering principles, or where such techniques are to be introduced by the industrial engineering department of the firm, the advantages of training a workers' representative from the outset of the work-study process should be given the most favourable consideration as a further guarantee that workers' interests will be protected. This practice is common in some countries and industries; the firm concerned maintains the normal earnings of the workers' representative.

46. Training Within Industry, commonly known as T.W.I., has proved of great practical value in many undertakings. It is recommended that all undertakings should adopt some system of this nature, adapted to the conditions of each country, with special emphasis on the development of job simplification.

47. The introduction and development of industrial engineering is not regarded as a substitute for the normal process of wage negotiation between trade unions and management at the plant, regional or industry level. It is therefore emphasised that trade unions should, where practicable, have fully trained personnel on their staff capable of exercising the function of negotiation as experts independent of management.

48. Procedures and practices regarding promotion and upgrading should be such as to give workers full opportunities of access to higher grades and to encourage them to put forth their best efforts. These procedures and practices should be known to every employee and made manifest by both example and precept. Opportunities for applying for such positions as charge-hand, assistant foreman or foreman should be publicised within the undertaking before recourse is had to outside recruitment. Some undertakings have found it appropriate to hold open competitions for these and other positions. In considering qualifications for upgrading, consideration should be given to the abilities to appreciate human values and maintain good relationships with fellow workers.

49. In view of the fact that in all industries methods and systems of remuneration have a great influence on output and on productivity, particular attention should be given to such methods and systems. The Meeting did not discuss in detail the question of payment by results, this subject having been dealt with by the Meeting of Experts on Systems of Payment by Results convened by the International Labour Organisation in April 1951. Attention is drawn to the statement of General Principles concerning the use of systems of payment by results adopted at this earlier Meeting, which is reproduced as an appendix to the present document.\(^1\)

\(^1\) This statement has not been reproduced here but may be referred to in *Payment by Results*, op. cit., Chapter VIII; also *Industry and Labour*, Vol. VI, No. 7, 1 Oct. 1951, pp. 270-275.
50. In the determination of wages, attention should be given to the desirability, subject to the payment of adequate remuneration to the lower-paid workers, of maintaining such differentials between the wages of supervisory, skilled, semi-skilled and unskilled workers as will provide them with adequate incentives.

51. Attention should be paid to the desirability of making the system of wage payment as simple as possible and of explaining it clearly; it is important in the interests of higher productivity that workers should understand the system in use, and should be able to check their own production and wages.

52. In addition to other incentives which may be provided to encourage higher productivity, it may be desirable to provide special incentives for the saving of materials.

53. The knowledge and experience which workers have of actual working conditions, of materials, equipment and handling, are of great value. Full advantage should be taken of this knowledge and experience. Favourable consideration should be given to the institution of suggestion schemes under which suitable payments are made, having a reasonable relation to the benefit accruing to the undertaking as a result of suggestions received. Valuable results have been obtained by associating suggestion schemes with programmes for training workers in methods of increasing productivity and by encouraging them to formulate suggestions on specified points.

54. Attention should be given to the importance of good physical working conditions—plant layout, cleanliness, tidiness, lighting, heating, ventilation, etc.—and of welfare facilities in the building up of a contented, stable and efficient labour force. Where no adequate provision for consultation and co-operation between employers and workers on welfare matters exists, either through legislation or through collective agreements, measures should be taken to provide for such consultation and co-operation.

55. Vigorous measures to promote safety and health should be regarded as an essential part of any programme to raise productivity. In plants of sufficient size there should be a full-time safety officer; in smaller plants there should be an officer who, as a recognised part of his duties, assumes responsibility for safety work and regularly devotes a part of his time to discharging this responsibility. Efforts should be made to promote "safety consciousness" and safe working methods throughout the plant by all available means, and workers' representatives should participate in such efforts.

56. While the foregoing suggestions cover women workers as well as men, special consideration should be given to the specific problems concerning women workers, in order, inter alia, to promote an efficient distribution of the labour force and to afford—
(a) to all women workers the opportunity of performing efficient service suitable to their aptitude and ability;

(b) to women workers with domestic responsibilities, conditions of employment which facilitate the performance of their domestic obligations.

Special measures may in certain cases be necessary in such fields as social services, health, welfare, selection and training.

**Plant and Equipment**

57. Management should have constantly in mind the question of whether the installation of new capital equipment is needed or whether satisfactory improvement can be effected by modification of existing equipment or improvisation.

58. In plants where machinery is inadequate or obsolete a high priority should be given to the task of extending and modernising mechanical equipment. Great care should be devoted to the selection of equipment of the type most appropriate for the purpose in hand and to the adaptation of equipment and techniques to local conditions so as to promote the best use of available capital in combination with the full utilisation of other resources. In this connection, liaison between manufacturers using machinery and those who make it offers substantial scope for raising productivity.

59. Efficient handling of materials is an important factor in raising productivity. Economies in this field may be achieved through (a) carefully planned layout, ensuring a proper sequence of operations, and (b) mechanisation of handling to the maximum degree practicable. There is considerable scope for ingenuity in using the available material-handling equipment to the best advantage. The modernisation of equipment should often start in this field.

60. There is often considerable scope for saving labour at relatively little expense through the mechanisation of auxiliary equipment, for example, the use of powered hand tools.

61. Special care should be devoted to the maintenance of machinery, emphasis being placed on preventive maintenance. There should be well-planned maintenance schedules and specialisation of maintenance functions. In some large undertakings good results have been obtained by decentralising maintenance staff, integrating it in the production services, and leaving maintenance workers subject to directives from the maintenance engineers on technical matters only.

62. Higher productivity requires the development and the maintaining of a correct balance in the productive capacities of different departments in order to avoid bottlenecks.
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