Readings in Global Organization Design
Articles

PIECEWORK ABANDONED
The effect of wage incentive systems on managerial authority

by Wilfred Brown

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PIECEWORK ABANDONED
The effect of wage incentive systems on managerial authority

by
Wilfred Brown

By the same author
Exploration in Management

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The Glacier Project

This book is one of a series concerned with publishing the results arising from the Glacier Project. This Project has been concerned with research into industrial organization and has been carried out by The Glacier Metal Co. Ltd., in collaboration with their Consultant Sociologist, Dr. Elliott Jaques: it is now in its fifteenth year. A bibliography of the other publications appears at the end of the book.

The Company has established a training institution which runs courses for senior managers from industry. Details of these can be obtained from the Principal of G.I.M. Ltd, 17 King Edward's Road, Ruislip, Middlesex.
Acknowledgments

As the content of this book is based on work done in a collaborative research programme, acknowledgments are due to all those who have taken part in this project, which has involved hundreds of members of The Glacier Metal Co. Ltd.

Mr. R. F. Harcourt of Brunel College rendered welcome assistance by selecting and providing me with copies of several reports of research work done on the subject of wage incentives.

The project is based on collaboration with Dr. Elliott Jaques, our social consultant, and several drafts of this book have been discussed with him. I am grateful to him for much cogent advice and many suggestions for amendment which I have incorporated.

I am much in the debt of Miss M. Davis, who has typed all the drafts, done correction and checking work, and prepared the index.

Introduction and Definitions

This is an essay on methods of paying operators in the engineering industry. I cannot reasonably extend the considerations which I put forward to other industries because I have insufficient experience of their method of operation; I must, therefore, leave the reader from other industries to judge whether what I say is relevant or not.

My own experience over the last thirty years causes me to be deeply concerned about the extent to which managers place reliance on the introduction of wage incentive schemes as a means of increasing the efficiency of their company's operations. It is apparent that companies frequently reach the stage when they feel that the time has come to give themselves a good 'shake up'. A consultant is engaged and he proceeds to do a great deal of extremely valuable work concerned with the study of the company's organization, the techniques which it uses, its various routines for controlling work and its programme of work. As a result of these studies, considerable change is made but very frequently the introduction of these changes is accompanied by alterations in the basis of payment of wages to hourly paid operators from hourly rates to some form of wage incentive system. The sum total of these changes frequently produces a substantial rise in operating efficiency but I have observed over and over again that the managers concerned constantly make claim that this increase of efficiency is the result of the
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wage incentive system. They attribute the result of changes on a wide front to a single phase of that change.

Thus it is that a climate of opinion is built up which conditions others to believe that the best short cut to increased efficiency is the introduction of a wage incentive scheme. I believe this generalisation is not only invalid but also extremely unfortunate. I seek to show, therefore, in this essay some of the false assumptions upon which this generalisation is based and to demonstrate that, contrary to the general view, a move away from wage incentive schemes in our Company did not bring about a drop in production and in other ways benefited us materially. I shall also show that moving back, if I may put it in that way, to the payment of hourly rates to operators had the result of focussing the attention of managers more closely on a number of important issues which are usually overlooked in the search for greater operating efficiency. In support of these contentions, I describe some of the negotiations which took place to bring about this change in methods of paying wages and the consequential results for our Company.

A number of large firms in this country have changed from wage incentive schemes to hourly rates but none, to my knowledge, have recorded their experience. The result is that whereas there are large numbers of managers who quote what I believe to be unvalidated evidence in support of the belief that wage incentive schemes bring great benefits there is, on the contrary, very little recorded evidence which states the opposite case. There appears to be a strong general climate of opinion in favour of wage incentive systems and this is having a growing effect. In October 1961, for instance, the Ministry of Labour Gazette reports that as a result of a survey of 7,000,000 manual workers it is estimated that 33 per cent. of all wage earners in 1961 were being paid by piecework or output bonus systems, compared with 31 per cent. in 1957 and 25 per cent. before the war. It is, therefore, little wonder that many of the smaller firms are, as they face the problems of growth, so easily convinced that there is a sort of magic in a wage incentive scheme.

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There are a number of 'sacred cow' ideas which roam the thoughts of people in British industry. Included amongst them are these assumptions that people will not work without a carrot dangling in front of them; that ratefixing is a scientific operation concerned with real measurement; that changes in organization and methods cannot be introduced without simultaneous introduction of wage incentives and that the only viable way of exercising real control over manufacturing operations is through such incentive systems. If this record of our Company's experience dissuades some from a too precipitate adoption of wage systems which, I believe, will not lead to their own optimum performance, I shall have achieved my aim.

I also have another purpose in writing. In one sense the material which I am committing to paper is quite commonplace, but in another sense it is not. It seems to me essential that newcomers to industry, trainee managers, representatives and others, should be able to have a better balanced picture of industrial experience vis-à-vis methods of paying wages and the different results that flow from different systems. As I have already said, I have not seen the specific experience of a company which has changed from incentive systems to hourly rates written up with a record of what happened in the years that followed. As a result of this, I have noticed a general tendency for people to accept the unfortunate general opinions to which I have referred above. I hope, therefore, that this essay will help to fill a gap in reading material in the interests of students and younger managers.

Finally, from the point of view of the Company with which I am associated, the lessons learnt during the period 1948–1960 were very important to that Company. I want to make certain that they are not forgotten.

Definition of Terms

The vocabulary of words available to industry for the discussion of payment methods is, indeed, something of a stumbling
block to clear thinking and discussion. Experienced managers and operators doubtless make themselves understood to each other but, with new entrants into manufacturing industry and those less experienced, serious misunderstanding frequently arises. Such misunderstandings are often the source of suspicion and hostility which inhibit the implementation of changes which, if clearly understood, would seem desirable to all concerned or, alternatively, would clearly be seen to be unworkable. In writing this essay I have had to read many documents relating to discussion and agreements about payment methods. In many of them the use of words is such that it is impossible to derive any clear meaning.

A glossary of terms is essential and I will establish one for the purpose of this essay.

**Piecework Pay** has, fundamentally, a clear meaning. It refers to the process of attaching a specific money price to an article or a particular operation performed upon it. Pay of the individual is then the product of the number of operations completed times the price. Under 'piecework systems' prices are without reference to the different levels of ability of those who perform the work. If the price is x, then whoever does 100 in a day earns 100-x. Unfortunately, the phrase has now come to be used for other systems which differ fundamentally. If I use the term I shall use it in its original restricted meaning. **Time Allowance Pay** is often erroneously referred to as 'piecework'. Piecework systems were gradually adapted by industry as operators were paid at different rates per hour. Thus, a group of piecework prices became identified as being work suitable for operators paid in accordance with piecework but possessing a particular hourly rate (which was also used for calculation of allowances, holidays, etc.). Sometimes, however, an operator with an hourly rate of say, 2s. 6d. per hour, was asked to work on tasks with piecework prices normally done by operators on a 2s. per hour rate. The piecework price was then 'plussed up' by 25 per cent. in accordance with the difference between the hourly rates.

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This 'plussing up' of piecework rates was a major cause of difficulty in our Company from 1940 to 1947, during which period changes were agreed which led to the piecework price being expressed as a time allowance for doing the job. This obviated altogether the need to 'pluss up' piecework prices because total earned was simply calculated by multiplying the 'standard hours of work completed', by the operator's rate per hour.

Piecework systems were adapted in many engineering companies in this way and this is why most so-called piecework systems are, in fact, systems which allot allowances for specific jobs in terms of time. When, therefore, in this essay I use the phrase 'piecework system' I refer to my definition and I shall use the phrase 'time allowance' and 'time allowance systems' to refer to its adapted form. Under the time allowance system it becomes possible for an operator to work say, 44 hours, and complete say, 66 hours 'work'. Thus, he is regarded as having earned 50 per cent bonus. (The 22 hours 'extra work' completed being 50 per cent above the actual hours worked.)

**Group Bonus Pay** is an adaptation of the time allowance system. Instead of calculating the percentage by which work achievement in hours exceeds his actual working time for the individual operator, the same calculation is done for a group of operators. When the group percentage earned is arrived at, then the bonus earnings of an individual operator are calculated by the formula: (Hourly rate × hours worked × group bonus percentage).

**Hourly Rate Pay** is the term I shall use where operators are simply paid at a pre-determined rate per hour for the actual number of hours which they have worked. Many different phrases are used to describe this method of payment, such as, flat rate, time rate, day work, etc. Such phrases have, I believe, a consistently understood connotation in industry but, to newcomers, they can be misleading and I suggest that the adoption by industry of a single word or phrase to label a specific method is much to be desired.

**Wage Incentive Pay** is the term I shall use to refer to all schemes whereby the weekly or monthly earnings of operators vary in
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In accordance with the assessed quantity of work done on a pre-determined basis. Such a term embraces piecework systems, time allowance systems, group bonus systems, but it also includes other systems such as the Rowan Premium Bonus System which I shall not discuss here. I do not, however, include profit sharing within the meaning of this term, or the Scanlon system or many others which, at fixed periods, award additional pay to operators in accordance with calculations which take into account wider aspects of the total operating economy of the company concerned. Nor do I include within the term systems which, from time to time, adjust the hourly rates of operators in accordance with a managerial assessment of the level of work done by the operator and his personal level of ability.

A great deal of confusion arises in talking about pay and work because of the use of words which cover more than one idea. For example, ‘rate of working’ is often used as a phrase but the question always arises as to whether the speaker is referring to pace at which an individual is working or the quantity which he is producing.

Elliott Jaques, in *Equitable Payment*¹ has discussed in depth the results of his research in the Glacier Project into pay and human capacity. In doing so he has established a number of definitions which I shall use in this essay. I set these out below, paraphrasing what he has written.

Pace refers to the actual rate of movement of a person; for example, the difference between walking slowly, walking quickly and running. Pace refers to Physiological Pace.

Application refers to the intensity of physical and mental concentration of a person on work. It includes the continuity of thinking about it, and the continuity of physical application, with minimum interruption for thoughts about other things or through minor unnecessary absences from the job during the working day.

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Level of Capacity refers to the ability of a person to perform a given level of work. Jaques has demonstrated that personal capacity is not static through time but changes in accordance with a field of curves. I need not in this essay explore this extremely important finding further. My object in stating the idea here is simply to provide a word with which I can refer to the physiological and mental skills inherent in a person which enable him to perform higher or lower levels of work.

Level of Work. Jaques has described a method of measuring level of responsibility of work by discovery of the maximum period of time during which marginally sub-standard decisions could be made by a person in a role before information about the accumulating sub-standard work would become available to the manager in charge of that person. There is no need for me to explore the notion further here because it has been fully discussed in his book *Equitable Payment*. I want, however, to establish the phrase for use in this essay.

We now have level of capacity and the level of work distinguished clearly by the use of two separate phrases. This is an important step because with so much of the language used to discuss industrial situations, e.g., ‘skilled work’ ‘technical work’ ‘managerial work’; it is not clear whether the reference is to the level of capacity of the person or level of the work itself.

¹ Heinemann Educational Books Ltd., 358.
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It is somewhat distressing to observe the frequency with which managers and others in industry tend to attribute the results which they observe to single causes. Strikes are attributed to the character of shop stewards, high output is attributed to production efficiency without reference to product design, selling effort and all the host of other variables present; low quality of the product is attributed to a low level of skill or integrity in the labour force, and so on.

In writing, therefore, about my own experience with different methods of payment I shall certainly not attempt to make quantitative statements about the results arising from different methods of payment, because I do not think it is possible to make valid statements of this sort. I want to record my own personal assessment of the different effects on behaviour and performance set up by different wage systems and to quote some of the results of study of the subject by others.

Incentive Systems Stimulate Work Study

I have no doubt that the introduction and operation of wage incentive systems stimulate the systematic study of work. Whilst it is clear that the techniques used to do work should be the subject of rigorous study, whatever the methods used to pay operators, such study becomes a sine qua non if wage incentive systems are in use because, without the knowledge which it provides, the setting of piecework prices or time allowances is not possible.

The work done by the major management consultant firms in this country since the war, in helping companies to take an objective look at the manner in which they organize work flow and the techniques they use, has been of great value to our whole economy. It seems to me, however, to be a great pity that in almost every case where they have launched a company on this highly desirable course of introspection they have persuaded those companies at the same time to change to wage incentive schemes of payment.

What appears to take place is this: A consultant carries out a preliminary survey and comes to the conclusion that, by a series of organizational and technical changes, it should be possible to increase output by 20 per cent. to 30 per cent. The consultant knows that this increase of output is going to be achieved by rearrangement of work. The operators, however, and possibly the managers involved, believe that an increased pace of work will be called for. Now people have a natural pace of work which is largely independent of environment, but owing to the confusion between pace, application and quantity of output this is not clear, and so we get those sterile notions which regard pace of working as a major determinant of quantity of output.

Emotions are aroused. Operators want wages to be geared to the pace of work. Managers are sure that the increased pace will not be maintained without wage incentives and that to increase hourly rates as a means of getting the new methods accepted provides no guarantee of increased pace.

There may also be a deeper reason present in the minds of managers for wanting a wage incentive scheme. If a professional man from outside the company can, by study, increase output by say 30 per cent., is this not a reflection on their ability? If,
however, it is possible to attribute the increased output to a wage incentive system, the introduction of which was not previously within the ambit of their authority, then everybody concerned feels better about the changes. Is this one of the reasons why so many managers quote wage incentives as an explanation of increased output? Could this be a reason why consultants so very frequently couple the introduction of reorganization of work with the introduction of wage incentive systems?

Whatever the answer is to these questions, the fact remains that it is virtually impossible either to introduce or maintain wage incentive systems without constantly maintained work study. The emphasis thus placed on work study is one of the advantages of such wage systems.

Incentive Schemes cause quick exposure of problems

Many factors such as availability of work, tools and drawings, state of repair of machines, quality of the work reaching a machine, are outside the control of operators. They must rely on supervisors or managers to take action to overcome deviations from normal conditions which inhibit optimum rates of working. If an operator is working on an hourly rate system these deviations will not affect his pay. His level of concern about them will be lower than if they did have this affect. The pay of operators working on wage incentive systems is lowered by such deviations. They become very anxious about non-availability of correct tools or materials and raise the matter with their supervisors, demanding that things should be put right in these respects or that a bonus allowance be granted to compensate for reduced output.

One could well suggest that the operator would be wise to get worried about these matters, whether or not they affect his immediate pay on the grounds that poor performance must, in the long run, affect his career. Equally, it can be pointed out that excessive reliance by supervisors on operators to call

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their attention to matters which reduce quantity of output is indicative of an organizational position which requires remedy. The fact remains, however, that with supervisory and foremen roles structured as they are in so many factories, great reliance is placed on operators for the signalling of situations which require remedy. To the extent that this is necessary, wage incentive systems assist very considerably.

Incentive Systems encourage some forms of Inventiveness

I think that wage incentive systems do stimulate inventiveness on the part of operators. By invention I mean alterations to methods within the control of the operator which increase output such as better ways of arranging work physically, minor improvements to jigs and fixtures, better choices of machine speed or tool feed, etc. These, with wage incentive systems, are, however, often kept secret lest they be taken into account when the job is retimed. Operators paid by hourly rate are also inventive, but one of the stimuli for such development of methods is lacking. I shall have more to say later about the effect of wage incentive schemes upon the inventiveness of managers and engineers when they seek to introduce the effects of the changes which these imply, into production.

Many people in industry pose this question: Do incentive systems make people work harder? ‘Work harder’ can mean, in this question, one of three things: either ‘faster pace’ or ‘greater application’ or it can simply imply ‘greater output’. I shall discuss each question separately.

Do Incentive Systems cause people to work at a faster pace?

I think not and I believe that most experienced managers will agree with me. Is it not true that each of us has a characteristic norm of pace? We can, in an emergency, work faster
than normal but for relatively short periods only. I cannot slow my pace down below my own normal rate except for short periods, and I believe that this is everybody's experience. If the flow of work coming to an operator fluctuates, if tools are missing or if drawings are not available then, of course, his pace of work slows down, but he protests. If an individual is asked to operate a machine which is cycling at a constant rate, then the machine will set the operator's pace; but if the pace set by the machine is above the normal pace of the operator, he will protest.

Thus, the picture of a group of operators paid by a wage incentive system and all working year after year at a pace that is inconsistent with the pace that they would choose in the absence of that method of pay is, to me, quite unreal. I appreciate that many people will not agree with me, but I have the temerity to suggest that the reason for their assumption is connected with the confusion that can arise over this question as a result of failing to think separately about pace, application and output.

One works manager, with whom I discussed the subject, agreed that people would not be caused to work at faster pace than their norm by a wage incentive system but claimed that without such a system, they would work below their normal pace. This view seems equally unreal to me.

Another works manager of my acquaintance heard that our Company were changing over from time allowance pay to hourly rate pay. He rang me and suggested that idealism was being allowed to run riot in our Company, we would lose output. I told him that in three departments we had dropped the incentive system and in three others it was still in operation. He said he would like to watch all the departments at work and I invited him to visit us. On arrival he asked me not to tell him the basis of pay of the departments because he proposed that a junior person should take him round each of them and he would be able to tell me on his return to my office, which was which. He got his answers 100 per cent. wrong; I do not think this proves anything in particular, except that there are too many emotional convictions about this question of pace and too little careful and disciplined observation.

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*Do Wage Incentive Systems increase the degree of Application to Work?*

I have already defined 'Application' in Chapter 1 but let me remind my reader that, in using the word, I mean the intensity of physical and mental concentration on work. Here, again, as with pace, I think each of us has an inherent capacity to concentrate our mental and physical energies in a particular direction at a given time. I do not think that wage incentives will heighten that degree of application but, other things being equal, they will prevent our application being easily diverted to other matters.

If other people go to an operator, paid by wage incentives, and begin interrupting him by talking to him he is, I think, much more likely to resent that interruption than if he is paid an hourly rate. In other words, if the operator has the feeling that an interruption to his concentration will cost him money, he will get impatient with the cause of interruption. This is, I think, one of the operating theories upon which so many managers base their faith in wage incentive systems, but I think that, in doing so, they overlook much of their own experience.

If the situation was as simple as I have inferred in the preceding paragraph, then wage incentive systems would be a great deal more effective in maintaining application to work than they are in practice. Theoretically one would expect, in a department paid on a Wage Incentive basis (I shall use the letters W.I. to refer to Wage Incentive from here onwards and H.R. to refer to Hourly Rates) that in the evening people would continue working right up to the end of the shift for, by stopping work, say, ten minutes early, they lose pay. The habit of easing off at the end of the shift is, unfortunately, too well established in industry and I have constantly watched in our own factories, and in those of other companies, to see if there
is any correlation between the basis of pay and different behaviour in this respect. I have noted no such correlation over fifteen years' quite frequent observation. I have discussed this point with hundreds of managers and very few claim that W.I. overcome the slackening of effort at the end of the shift.

One may well ask why this is so. I think the most general reason is because operators on W.I. systems set themselves pre-determined targets of what they regard as their proper weekly pay packet and they will maintain their application to work to the end of a shift only if they fear that they are having a 'bad week'. In other words, we are back to the question of personal norms of behaviour. Taking time at the end of the shift, stopping work for a short yarn with a friend as he passes, easing off for a smoke, and other inbuilt habits, are stronger than the pull of more money.

This is not the whole of the story, however. Anxiety about such matters as the fairness of the 'price on this job'; the fact that 'I've got this rotten job again'; 'the finish asked for on this job is impossible, I'll never make bonus on it'; 'the price on this job is screwy, I'll have to go easy or I'll make so much bonus that they will want to cut the price', and such considerations, represent a very serious interruption to application to the work in hand.

In the light of these sorts of consideration, I suggest that it is very difficult to support the idea that W.I. systems increase application to work.

Do Incentive Schemes produce greater output?

This is the million-dollar question but, by discussing pace and application, I think I have already begun to answer it. Output is a function of nearly all the facets of organization; techniques used; batch quantity; tools; level of capacity of operators; availability of all the essentials of the production process when required; uninterrupted flow of work to operators; the capacity of the managers in charge of the department; availability of machine maintenance men, machine setters and inspectors, etc.

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Looking at this in this way, the question itself begins to look absurd. In many factories which produce a wide range of products, it is virtually impossible to measure output at all. There is no common denominator available in which to express the changing mix of products undertaken each week by a department. The target hours or piecework prices set by time study men are no help for, as I shall show later in this chapter, these are not obtained by measurement.

Even if it were possible to measure output week by week, it would not help to answer the main question of this section for, clearly, changes in output are a function of all the many variables in a workshop and it is not possible to attribute a rise or fall in output to one variable, such as, a change in the method of payment.

I know that there are strong and widely held opinions in industry to the effect that W.I. systems do increase output but, as I have already stated, I think that this is due to confusion of thinking. Managers or consultants streamline work, change methods, institute work study along with the change to W.I. systems, and then assume that the increased output which seems to arise is due to the change of wage method alone.

In summary, therefore, my views about these three questions are that wage systems are not, in themselves, an important determinant of pace of work, application to work, or output.

Wage Incentives and Work Quality

W.I. systems are the normal practice are designed to pay operators only for 'good work' done. If all the parts coming off a machine are checked by an inspector in respect of all possible faults that can arise from the use of discretion by the operator before further work is done on those parts at another stage, and if this check is done before the operator is paid, then no difficulty
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arises. Such a system of review of work would, however, normally involve a very large number of inspectors and this is usually neither economic nor justified in terms of quality per se.

Close analysis of what, in fact, takes place reveals that a series of review mechanisms exist although they are seldom recognized. If one postulates a job passing through operations 1 to 20, each being done by a separate operator, then sub-standard judgment by operator 1 may not be revealed until operation 5 when the part fails to fit a jig at that operation. Sub-standard judgment by the operator on operation 7 may be revealed at operation 14 when dimensional measurements have to be taken for the purpose of operation 14, etc.

Now, the lapse of time between an operator performing his task until the review mechanism discloses whether he has done good work, may frequently be longer than the permissible lapse of time during which payment can be delayed to the operator. In practice, operators on wage incentive schemes must be paid at the end of the week following the one in which the work was done, and it is commonplace for the lapse of time between doing the work and the operation of review mechanisms to be longer than this. Thus, pay is made on the assumption that the work is satisfactory and, if it is later discovered to be sub-standard, retrospective adjustments have to be made which cause serious problems.

The problems can, in fact, be somewhat more complex than this, on account of other factors. Suppose that a part is turned on a lathe at operation 6, on the outside diameter, ground on the same diameter at operation 7, and that sub-standard work is detected at operation 14. The operator on operation 7 may claim, perhaps justifiably, that he found the parts coming from operation 6 marginally under-size and that work which has been judged to be sub-standard and caused by him was, in fact, caused at operation 6 and that he lost output and pay by a serious attempt to overcome this defect.

Suppose that there is a dayshift and a nightshift working in a machine shop and that, as a result, two different operators, one on day and one on night, have worked on the job later found to be sub-standard; if sub-standard work is detected it is then extremely difficult to discover which operator is responsible.

If the complexities of production are squarely faced, it will be realized that determination of the source of sub-standard work is very often not a matter of fact but of managerial judgment. This is the case whatever the type of payment system in use. If, however, a W.I. system is in operation, assessment of fault by a manager becomes a most delicate issue because it affects weekly pay. If H.R. systems are in use the immediate manager is, as I shall discuss later, in a situation where he is continually assessing each operator in his command not only on quality but on quantity, pace, application, the level of work he is being asked to do, etc. The question of quality, therefore, takes its place alongside other equally important criteria on which the performance of operators is judged by managers.

Under W.I. systems there is the danger that less attention is paid by managers to variations in quality of output because, with low capacity operators who turn out quite a lot of work, the assumption is made that they are being penalized for it because they earn low bonus. With high capacity operators, whose work is consistently good, the assumption is made that they have been rewarded by high bonus. In fact, quality of output is an extremely important index as to whether there is a reasonable equation between level of the capacity of a person and the level of work which he is being asked to perform, and should be regarded in this light.

I have heard many managers, not only in our own Company but elsewhere, voice the view that W.I. schemes reduce the quality of work done; that operators scamp work to get it done quickly and earn high bonuses. I have no direct evidence to show that this is so. My view is that this aspect of the disadvantage of W.I. schemes is over-emphasized because I

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believe that most people have an inherent attitude to work which inhibits them from consciously continuing to do sub-standard work.

**Pressure on Ratefixers**

In a particular department of our Company, operating on a W.I. basis, I observed that over a period of about fifteen years, the average bonus earned showed a consistent upward trend; starting off at around 40–50 per cent, it ended by in 1959 at 80–100 per cent. During the last seven years, the specific terms of reference to ratefixers were to set times which would enable the ‘average’ man, working at ‘normal’ pace, to earn 33½ per cent. For the last eight years this 33½ per cent was increased, by National Agreement, to 45 per cent.

During, for example, 1958 and 1959, there was a steady influx of new types of work into the department and all the various machine operations on such work had to be the subject of new time allowances. The terms of reference on all this new work were that time allowance targets were to be set in such a manner as to allow operators of ‘average skill’ to earn 45 per cent. One would have assumed that as the average bonus in 1958 and 1959 was fluctuating between 80 per cent and 100 per cent, the effect of this new work would have been to pull down the average earned in the department. In fact, this average rate of bonus continued its slow and steady rise.

This type of occurrence must be very familiar to those responsible for managing workshops where W.I. schemes are in operation. Two alternative hypotheses occur to me to explain the situation:

(a) That in 1958–1959 the average capacity of the operators in the department was some 40 per cent above the capacity of the ‘average’ operator’s performance on which the ratefixer based his calculations. This, however, is extremely difficult to accept. Throughout the period there was continual difficulty in engaging operators felt by the managers involved to be of sufficient experience and skill. The number of newcomers into the department per year averaged around 20 per cent of the total number employed.

(b) That the ratefixer is under pressure from operators, representatives, supervisors and managers, to set targets which enable operators to perform new jobs at the prevailing level of average bonus earnings, whatever it may be. If the ratefixer yields to these pressures and ignores his terms of reference, then this would produce the observed result.

I think there is no doubt that hypothesis (b) is generally true. Supervisors and immediate managers of operators do, in fact, avoid much trouble if all new jobs can earn the prevailing average rate of bonus. Representatives, in spite of agreements to the contrary, usually appear to assume that any target-setting on new jobs, which does not allow operators to earn the prevailing average level of bonus, is a form of ‘cheating’ on the part of management.

One can go further than this and suggest that a ratefixer who adhered to his formal terms of reference and succeeded in setting targets on new jobs which had the designed result of allowing the average operator to earn 45 per cent, would be looked upon by nearly all concerned, including management, as being foolishly rigorous.

There appears to be a wide discrepancy between the manifest terms of reference for ratefixers in industry and the real task which they are expected to perform. Is it the desire of management, in relation to a workshop where the average operator earns, let us say, 80 per cent, that the earnings of those operators should be sharply reduced because new work is introduced which, by National Agreement, should be targeted to allow the level of bonus earnings to be 45 per cent? I think not. Buried deep in W.I. systems are implied and accepted terms of reference which insist that a ratefixer takes account of the existing bonus earning levels in setting his targets, and
that even if his explicit terms of reference are different from these, pressures exist around him which cause him to adopt this course.

Wage Incentives and Batch Size

There is the problem of batch size or length of run. Allowances have to be made both for the 'setting time', during which a machine is being adjusted and the operator is not producing, and for 'start up time'. The latter type of allowance is necessary if the batch quantity involved is very small for, when this is the case, it is clearly difficult for an operator to 'get into the swing' of the job and attain that 'normal' rate of output which would result if the batch were larger.

These allowances are exceedingly difficult to set and are the subject of much intuitive judgment. Some such system of allowances for variation in length of run, is a component of most W.I. systems and adds materially to their difficulties.

Compensatory Allowances

In our machine shops, there was a system which allowed the issue of 'Additional Wage Issues' (AWIs). These were necessary to compensate operators for deviations on the job itself from those pertaining when the time allowance was set. Examples of such deviations are—correct tools not available, finish or accuracy required above standard, previous operation faulty and correction to be made, machining allowance on forgings or castings greater than allowed for, etc. The setting of the amount of an AWI was almost entirely a matter of judgment. Some such system which provides compensatory allowances is almost inevitably a part of any W.I. system. The time spent, the lengthy arguments, the clerical and administrative effort and the effect, at times, on the morale of those concerned, of such allowances used to appal me. It seems to me that the extent to which they caused the attention of all concerned to leave the essential questions of quality and quantity of output and instead focus on pay and allowances, was very serious indeed.

Wage Incentives and 'Ca-Canny'

The term is commonly used to refer to a particular practice operators tend to adopt in the presence of W.I. systems. Many managers state that maximum rates of output on the range of jobs being done in a department are agreed by the group of operators concerned with them and that any operator exceeding this rate is put under pressure by the others to reduce output to the agreed figure. I believe that this state of affairs does exist in many workshops, but I have no personal evidence either to support or deny the statements so often made by others. Managers refer to such a practice as a dishonest one because it restricts output, it hides the existence of time allowances which have been mistakenly set at too high a figure and which may require correction. Managers claim that the earnings of the most skilful operators are restricted by the practice and they tend to leave the department, or the company, for other jobs.

I have frequently talked to groups of operators who, whilst denying that they found such practices necessary themselves, justified them in principle on the following grounds. If a particularly adept or fast operator (and stress was laid by them that he might well not be the most skilful—although I do not think this differentiation between pace and skill is justified) produced a job at a rate well above the norm, he thereby set up the situation in which management could claim that the time allowance was too generous and demand a re-timing; thus, by his act, the operator might bring about a situation where the time was reduced and everybody must work at a more than reasonable speed to earn a reasonable wage. They claimed that such a practice as 'ca-canny' protected slower operators from low wages by preventing the
setting of time allowances, based on super-speed performances of abnormal operators, which would be unfair to them. They agreed that such practices could hide ratefixing errors on jobs where time allowances were, in fact, too high but justified this on the grounds that there were also ‘tight jobs’ where allowances were too low and on which management often refused a re-timing.

In as far as the practice of ca-canny exists, it is the negation of the ostensible aim of W.I. schemes which is to maximize output. On two occasions at conferences of managers I have pointed out to them the inconsistency between two views held and expressed by almost the entire group present:

(a) That wage incentive schemes are essential to high output, and
(b) that ca-canny practices are widespread wherever wage incentive schemes operate.

There are a number of other practices linked to this subject of ca-canny, to which I will make brief reference. It is not uncommon for operators working on wage incentive systems to operate a private system of their own, sometimes known as ‘banking of work’. An operator, during a particular week, will either ‘feel good’ and turn out a large quantity of work or he may have a fortunate week in which he has been allotted jobs on which target allowances are higher than normal. At the end of the week he will calculate that he has earned considerably more than his personal weekly pay target. He feels that in the following week he may be less fortunate and, accordingly, he will fail to return job tickets from some of the work done, in order:

(a) Not to draw attention to his high bonus earning in that week, and
(b) that he may be able to carry over into the following week,

when he may be less fortunate, some of the earnings of the current week.

On the face of it, this practice appears fairly harmless but, if the production control section is relying on this man’s job tickets to keep them informed of the rate of progress of work through a workshop, then the practice can have serious effects on such control mechanisms.

Wage Incentives and Change in Production Methods

Practices and attitudes which are inimical to change of production techniques, mechanization, introduction of better machinery, are one of the more serious outcomes of W.I. systems. I believe it to be a fact that the hostility and suspicions engendered in the minds of operators by such pay systems, have the result that relevant and important changes in work method are often seen by operators as attacks on their standard of living because such changes involve the setting of new piece-work prices or time allowances. Operators using new methods often cannot initially produce at the pace which will later become possible with normal effort and the change of method is, therefore, opposed. I am aware that there are widespread practices of setting interim time allowances subject to review after familiarity with new methods has been established. The arguments, politics and pressures, however, which arise from these interim targets and their subsequent amendment to established time allowances, often exacerbate the atmosphere of suspicion.

There are widespread agreements to the effect that once time allowances have been established they will not be adjusted without joint agreement. These often produce the result that badly judged time allowances persist because, in the absence of agreement on the part of representatives that they are, in fact, faulty, no action can be taken by management. Such ‘loose targets’ not only reduce output seriously but also set up
jealousy in a workshop because the favoured operators who work on such jobs can either take it easy and earn normal bonus or are able to earn super bonus, not because of application or pace of work but because they have been favoured by being given the job.

It is thus important for management to keep a curb on the number of 'loose target' jobs in the department. With a clear managerial structure, a sound representative system and the habit of tackling problems of this sort, it can be done, but these conditions are not always present. There is thus a tendency for new methods and innovations to be used at times by managers as a means of dealing with these 'loose targets': 'If you cannot get agreement from representatives to re-time a job because the allowance is too generous, then change the method of manufacture and it will have to be timed afresh.' Situations like those described and the ever present fear that new machinery means new methods which mean new time allowances, possibly leading to reduction in pay, set the scene for anxiety about innovation. Management invests additional capital in new plant to increase the degree of mechanization and, in the debate which follows with representatives about time allowance, 25 per cent of the increased productive capacity may well be thrown away. Allowances are demanded, which are clearly more than necessary, to maintain the norm of bonus earnings. There is then a real danger that operators, having won the argument for excessive time allowances, will, instead of taking advantage of such a deal by increasing earnings and output, limit earnings to the old normal figure and thus output is lost.

In many factories experience has taught managers that innovation in method means trouble, conflict, arguments, bad feelings or even, at times, strikes. This produces caution, hesitation or even abdication of responsibility to introduce better techniques. These attitudes tend to reduce the rate of investment in improved tooling and better plant. I do not think I am overstating the case against W.I. systems when I suggest that they are one of a number of important factors which keep the rate of investment in new machinery and methods down to a level which is too low.

Wage Incentives and Managerial Structure

Picture a situation where an operator is being paid on a W.I. basis and is working on a job whose accuracy and finish is of vital importance to the company. The foreman, watching the operator at work, stops him and instructs a change in machine speed. At once a pay problem has appeared. Some adjustments to target time will have to be made or an additional wage issue agreed to compensate the operator for loss of bonus. It can easily be understood that dozens of such incidents can arise in a machine shop during a day's work. The foreman, in order to achieve the output or quality results with which he is charged by his manager, wants to switch operators between machines, change the material, alter methods, etc. But each time he does so the problem of wages arises.

There are, indeed, many inconsistencies between W.I. systems and managerial control of work. Indeed, to some managers, W.I. systems are felt to be a means of lessening the necessity for managerial supervision of work. The theory is that operators, under the stimulus of bonus earnings will, of their own volition, carry out many of the acts which would otherwise have to be the subject of instructions. There is some reality in this point of view and I shall later in this book discuss the changes in managerial structure which were supported and stimulated in our Company when we abandoned W.I. systems.

The other side of the penny, however, presents a problem. Just as W.I. systems tend to make supervision of work less necessary they also make it less possible. These systems thus tend to stimulate abdication of necessary decisions on the part of supervisors and foremen. In a previous section I have talked about the problem of operators tailing off work before
the end of the working shift. In the presence of W.I. systems a foreman who uses his authority to remonstrate with those indulging in this practice, may be told in so many words to mind his own business. ‘We have stopped work early but we are paying for it—why are you worrying?’ Perhaps it is an exaggeration to suggest that such words are actually used but that can be the atmosphere. W.I. systems go some way towards putting operators in the same position as subcontractors who have taken on a job for the company at a fixed price and must be left to complete it in their own time and in their own way.

If a foreman is to be a manager in any accepted sense of the word, then he must be responsible for the quality and quantity of the work which he has allocated to his subordinates—the operators. But it is inconsistent to expect a foreman to accept such responsibility and, at the same time, to place the fixing of time targets or piecework prices in the hands of a ratemaster over whom he exercises no control. The decisions of that ratemaster with regard to time allowances will exercise a vital effect on the work of the foreman’s subordinates.

A foreman’s real job involves knowing each of his men; allocating what he feels to be suitable work to each; assessing their performance; encouraging and rewarding them if they, in his estimation, do well; criticizing their performance if it is below acceptable level, and disciplining insubordination. If, however, owing to the vagaries of the W.I. system, some operators, assessed by him to be very good, earn low bonus, and others, assessed to be poor, earn very good bonus, then there is inconsistency between the foreman’s assessment and the apparent work results as measured by bonus earning performance. Most foremen will agree that such situations are at least not unknown.

Very tricky situations can develop for a foreman around the business of allocating work. Operator A has, for a long time, been doing good work on job X and, incidentally, has established for himself a very satisfactory rate of bonus earnings.

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**The Merits and Shortcomings of Wage Incentive Systems**

Job Y is an unpopular one in the department because it is felt to be difficult to earn a high rate of bonus whilst working on it. Extra demand arises for job Y; the company falls behind with delivery. The foreman is faced with the urgent necessity of taking operator A off job X and putting him onto job Y. That foreman is in difficulties. There is a general problem in the management of manufacturing operations; it is difficult to control workshops in such a manner as to ensure that the delivery priorities allocated to specific jobs are observed. Statements such as the following abound:

‘We put up the other job first because we could not trust the operator on the vacant machine with the urgent job.’

‘We did not put up the urgent job because the other job was running and it seemed a pity to break it down.’

But I think that a great deal of this sort of trouble arises, in fact, from W.I. systems. Certain jobs become almost the perquisite of specific operators and if, in order to give the correct priority, a foreman changes jobs about then he is in difficulties with his men, so he keeps the non-urgent job running and is late with the one that is urgent.

There are many other ways in which foremen are stimulated to abdicate from proper decisions and on which the status of their role is lowered by W.I. systems.

Professor Douglas McGregor, of the School of Industrial Management, M.I.T., in his book, *The Human Side of Enterprise,* has, I believe, described the situation extremely well in the following paragraphs:

Individual incentive plans provide a good example of an attempt to control behavior which fails to take sufficient account of ‘natural law’—in this case, human behavior in the industrial setting.

The practical logic of incentives is that people want money, and that they will work harder to get more of it. In accord with this logic, we measure jobs, establish standards for ‘a fair day’s work’, and determine a scale of incentive pay which provides a bonus for productivity above the standard.

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1 McGraw Hill.
**Piecework Abandoned**

Incentive plans do not, however, take account of several other well-demonstrated characteristics of behavior in the organisational setting: (1) that most people also want the approval of their fellow workers and that, if necessary, they will forego increased pay to obtain this approval; (2) that no managerial assurances can persuade workers that incentive rates will remain inviolate regardless of how much they produce; (3) that the ingenuity of the average worker is sufficient to outwit any system of controls devised by management.

A 'good' individual incentive plan may bring about a moderate increase in productivity (perhaps 15 per cent) but it also may bring a considerable variety of protective behaviors—deliberate restriction of output, hidden jigs and fixtures, hidden production, fudged records, grievances over rates and standards, etc. In addition it generally creates attitudes which are the opposite of those desired—antagonism towards those who administer the plan, cynicism with respect to management's integrity and fairness, indifference to the importance of collaboration with other parts of the organization (except for collusive efforts to defeat the incentive system).

All of these results are costly, and so are the managerial countermeasures which must be established to combat them (staff, effort, elaborate control procedures, closer supervision, concessions with respect to rates, down-time provisions, setup arrangements, etc.). If the total costs of administering the incentive program—both direct and indirect—were calculated, it would often turn out that they add up to more than the total gains from increased productivity. Certainly the typical incentive plan is of limited effectiveness as a method of control if the purpose is to motivate human beings to direct their efforts towards organizational objectives.

I have not yet, except by inference, considered the question of the degree of accuracy with which it is possible to set the targets upon which W.I. systems are based. This is an area of thinking in which a great deal of confusion exists and I discuss it in the next chapter.

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**The Inaccuracy of Ratefixing**

One of the strongest psychological bases of the preference shown by many managers for W.I. systems lies in the attraction of the idea of measuring work and measuring the performance of operators. Not only is there a natural desire for measurement where it is possible, but the feeling is that if the performance of subordinates can be measured, then it will release managers from the burden of making an assessment of performance.

It requires ability and courage for a manager to say to a subordinate: 'I am not satisfied with your work, I have been noting your performance for some months, you will have to pull your socks up; in particular I want improvements in the following respects,' etc. If there is something that looks like a measure of a subordinate's performance, then a manager escapes the burden and responsibility of making a personal judgment. He says instead: 'You are not doing well, look at your output figures; no, there is no use arguing about it because it is not a matter of my opinion, look at the figures!

I shall show in this chapter that neither piecework prices nor time allowances are the result of measurement but that both result from the use of judgment by ratefixers and, moreover, that these assessments do not have anything approaching the degree of consistency which is required to form the basis of either wage payment or the judgment of performance of operators.
First of all, I must define precisely what I mean when I use the word *Measurement.*

Many industrial people assume that because some aspect of a matter is *expressed* quantitatively in numerical indices therefore it has been the subject of measurement. One of the most glaring examples of this is the subject of costs. People assume, when they are told that an object costs £X to manufacture, that £X is a measurement. This, of course, not true, for £X in this case is the end result of a series of calculations and *assessments.* Before going further, therefore, I must state exactly what I mean by measurement.

Measurement is the process of ordering data or observation to a scale of length by means of objectively definable operations. Measurement is not to be confused with guessing, counting, appraisal, evaluation or assessment.

Temperature can, for example, be measured by relating changes in temperature to a spatial scale of length of a column, say, of mercury, by means of an instrument called a thermometer, the construction of which can be operationally defined.

The time taken by an operator to perform an operation can be measured by ordering the duration from start to finish to a spatial scale of radial distance travelled by the hand of a stopwatch, the construction of the watch being operationally defined. If, however, the person who measures that time uses his result plus his *assessment* as to whether the individual timed is working at normal pace and, on the basis of that measurement and that assessment, he states a time target in units of minutes, he has *not* produced that target by measurement.

One of the chief characteristics of measurement is that any two persons who know the instrument will get the same result from its use on any given datum within a known and statable margin of error.

It may be thought that these issues of definition and measurement are nothing more than frills, questions of semantics, mere quibbles over words. They are not. Being able to put things in quantitative terms may result in a false sense of security, for it tends to imply that measurement has been carried out according to a scientifically reliable method. It suggests that anything that can be stated in figures cannot be quarrelled over and must exist in reality. In fact, nothing could be further from the truth.

**Level of Responsibility of Work**

One of the most important findings of the fourteen years of work that have so far taken place on the Glacier Project, is the notion that work can be described in terms of its prescribed content and its discretionary content. Every role in industry has a range of duties which the individual must perform if he is to avoid a charge of insubordination, and a range of decisions that he must take. Thus, the real nature of work is concerned with the use of discretion or the making of decisions by those who do it. If, however, one examines the decision-making component of work one discovers that it is carried out at different levels by people who, in other respects, are doing the same tasks.

Let us take an example. Operators A, B and C are all working on the same type of lathe, machining the same castings on the same faces to the same dimensions and limits. *Apparent* they are doing precisely the same job. Let us, however, take another look at the situation. A’s work is inspected at hourly intervals by a floor inspector; thus, the decisions which he is making that affect finish, accuracy, rejection of castings with defects, etc., endure for a maximum period of an hour before the review mechanism represented by the floor inspector checks his use of discretion. B’s work is passed in batches to an inspection department at the end of the day. By the end of the following day at the latest, his work will have been...
checked in all respects. The lapse of time between B’s decisions and the review of them will be a maximum of two days. C is known for the high quality of his work and, as with B, his work is passed into an inspection department but a review does not, in fact, take place except that the quantities are checked and any glaring deviations picked up. The review of C’s work, in fact, takes place following a later operation performed on these castings when a full dimensional inspection is made before despatch to another factory for processing, and the maximum period which will elapse before this full check takes place is two weeks. In terms of Jaques’ findings about level of responsibility, A is doing the least responsible and C the most responsible job, and he has established a very significant correlation between what will be felt to be fair pay for the job and this time-span of unreviewed use of discretion.

A further finding that emerges from this work is the notion of differential level of capacity of individuals to do work. Thus, A, if asked to do work in the same way as C, will probably make a series of quite poor judgments and will be made extremely anxious by being put in a position where he has to wait up to two weeks to know whether the discretion he has used on the job is sound or not. If the proposal were put to his manager that A should be treated in this way, he would probably express great alarm and say that he was not yet sufficiently skilled to be trusted in that way. I shall use the term ‘level of capacity of the individual’ to refer to this quality which enables an individual to make his own decisions and carry the responsibility to continue to make them over different periods of time.

It may not be appreciated by the reader that the very essence of all business work is concerned with the use of discretion—the making of decisions by individuals. Given a process which requires no human judgment or exercise of discretion, and any well-organized company will mechanize it. To put this in another way, one can say that the thing which prevents operations or processes being mechanized

is the need for human judgment. Furthermore, Jaques’ researches (and I think his hypothesis is valid) suggest not that we should pay on the basis of the time-span of unreviewed discretion but that this is the basis we intuitively attempt to use in assessing fair pay for given work.

Ratefixers can measure the time which physical work takes to perform with a high degree of consistency. (Many authorities find the degree of accuracy to be within plus or minus 3 per cent.) But they are measuring one facet of work; its physical manifestation, which can be observed with the eye. They are not measuring the degree of responsible judgment shown by an operator in doing work. This, then, is the first thing to note about target setting for W.I. systems. If that were the only basis for the statement that ratefixing is not measurement of work it would, in my view, be sufficient. The process is, however, open to criticism on other counts also.

Having timed an operator over the necessary number of repetitions of the job, the ratefixer must then make the following judgments.

(a) Is the operator performing at the normal pace of the average operator and, if not, how much above normal pace is he working? To answer this question the ratefixer must use intuition.

(b) Are the operator’s movements efficient or is he taking longer than would be necessary if he were taught how to conserve his own physical energy by using it in a more intelligent way on the job? The ratefixer has to make an intuitive decision about this.

(c) No doubt the manufacturing layout prescribes the technique which the operator has to use very closely in terms of tools to be used, machine speeds, design of cutting tool, sequence of operations to be performed but equally there will be substantial discretion left to the operator in terms of how he physically arranges his work. Is the box of castings to be machined on his right- or his left-hand side? Where does he
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place the file which he uses for deburring the facing of the casting whilst it is rotating in the chuck on the lathe? How often does he stop to examine his tools to see if they need regrinding, etc.? No doubt the ratefixer will point out the more obvious deviations from sound practice, but discretion will remain. Thus the ratefixer has to judge intuitively whether this is ‘an intelligent or not so intelligent’ operator.

d) Next we come to the subject of application, which I have defined earlier as continuity of thinking about work and the continuity of physical application, which can be interrupted by thoughts about other things or through minor unnecessary absences from the job during the working day. The ratefixer can time the operator while he is working but, in doing so, he has also included in his measurement variations which arise from variable degrees of application. He must make an intuitive assessment as to whether continuity of application is high or low.

It can now be seen that we have a number of variables in the situation which are not normally taken into account in an explicit fashion although they have to be assessed at an intuitive level by a ratefixer. It is the necessity to assess these matters intuitively which produces very wide and quite unacceptable variations in targets set which constitute one of the fundamental difficulties of wage incentive schemes.

On the basis of experience of many types of wage paying systems in our Company and the research done into ‘work’, I would say that industry at the moment is giving the ratefixer an almost impossible job. At his skilled best, a ratefixer will produce target figures which can result in a degree of variations in the level of earnings on the part of individuals which are tolerable neither to those individuals nor to the management of the company. These variations force into existence a whole series of practices which are known by experienced managers to exist but which are not faced because the alternatives are either to abolish W.I. schemes or to become involved in a level of analytical research and thinking which is generally not acceptable.

At this stage, it seems appropriate to interject the findings of others on the subject of accuracy of ratefixers. In 1954 Winston Rogers and J.M. Hammersley published the results of research carried out by them in Occupational Psychology (Vol. 28, No. 2). This research was sponsored by the Nuffield Foundation and carried out at Acton Technical College under the guidance of a most distinguished committee of scientists. The following is a quotation from the findings:

The figure of 21 per cent (standard deviation) is of the greatest interest because it measures the error which one would expect from a typical observer drawn from the aggregate of all study-men of various creeds and organizations. Or it can be interpreted as measuring the inconsistency within such an aggregate. One commonly hears time-study spoken of as being a procedure accurate to about 3 per cent; this would imply a standard deviation of 1% per cent. The inference is then that this experiment has shown that time-study is fourteen times as inaccurate as it is commonly supposed to be. Thus, when it is stated that the standard deviation of the variation in observer’s final figures is 21 per cent, this means that, if the average final figure of a group of typical observers is X, about two-thirds of the observers in this group may be expected to produce final figures not differing from X by more than plus/minus 21 per cent of X, whilst nearly all observers may be expected to provide figures not differing from X by more than twice this percentage of X. In this case, nearly all observers should give final figures lying between 0·58X and 1·42X, a ratio of rather more than 2 to 1 between the highest and lowest estimated final figure.

In the same year (1954) R.G. Stansfield of the D.S.I.R. prepared, for the Research Advisory Group of the Panel on Human Factors of the Government Committee on Industrial Productivity (paper CIP (HER) (49) (9), a paper entitled ‘The Accuracy of Effort Rating in Time Study’. The following two paragraphs appear in the summary:

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(a) Effort rating of the worker is an integral part of the normal technique of Time Study; the effort rating is a subjective judgement made by the Time Study man. This paper points out the present gross lack of information about the accuracy achieved in rating; a lack the more remarkable in that Time Study claims to be scientific. However, some evidence can be obtained from recently published research at Purdue University, U.S.A., in which many experienced raters independently rated the same operator (who worked at a number of different speeds). The form of presentation of the results is criticized (in particular, only correlation coefficients are quoted), and they are of doubtful scientific value; but they suggest that, as a percentage of the mean rating, individual rating showed a standard deviation of the order of 15 per cent from the rater’s personal self-consistent scale, and of the order of 20 per cent from the self-consistent scale of the group.

(b) This accuracy seems not to be as good as is required for the purpose for which Time Study is commonly used; but it agrees, in order of magnitude, with the discrepancies quoted by Gomberg in U.S.A. between ratings made simultaneously by Time Study engineers, one employed by the management of the firm and the other employed by the Union.

These two papers report findings which are consistent with each other and they are consistent with my own views which are based not on research but on the intuitive assessment of my own experience. But I think there is a great deal more support for these findings available for the asking. If experienced managers, time-study men and operators are questioned on the subject of accuracy of job target setting, I think that the vast majority will, if they understand the questions asked, state conclusions which are consistent with those stated above.

Now, if I am right in these broad statements then we are faced with a curious and potentially very dangerous situation. Millions of people behave as though work targets can be set with sufficient accuracy to form the basis of payment systems whilst, at the same time, they know, at least intuitively, that this is not possible.

In the last section of this essay I shall have comment to make on the current concept of ‘economic man’. I mention the topic here because I want to conduct as honest an argument as possible. I have stated some of the pros and cons of W.I. systems as fairly as I find possible, but I am aware that I may not have done full justice to the arguments in favour of them. I think the reason for this is a strong bias in me against them not entirely because of their inherent nature but because they are part of the total culture which regards man as a predominantly economic animal. Thus, I am against piecework systems and time allowance systems because they seem to stimulate the less civilised area of man’s emotions and tend to inhibit those areas of consciousness associated with tolerance and co-operativeness. It was the pros and cons of W.I. systems which I have cited, coupled with this basic objection to the underlying cultural basis of such systems, which caused me to lead our Company into the series of changes which I will describe in the next chapter.
**Dropping Wage Incentives**

Throughout the period it has been, and still is, employed almost exclusively in the development, manufacture and sale of plain bearings for all types of machinery. About half of the output is used by the motor industry and the rest by general engineering.

**The Foundry**

In 1948 there was in operation a group time allowance system. The Foundry was divided into several sections concerned with coremaking, moulding, closing of moulds, furnaces, pouring, settling, etc. To each individual casting a time allowance was attached for each one of the processes through which it passed. It thus became possible to 'value' the total output of good castings from the Foundry in terms of time. This total achievement was then compared to the actual hours worked by the group and the percentage by which the achievement exceeded actual hours, was established. Each worker in the Foundry then received this percentage as an addition to the basic portion of his hourly rate.¹

The range of weight of castings varied from a few ounces up to more than a hundred weight; casting design varied from simple cylindrical shapes without cores to those requiring many cores and much change of a section. All castings were made in some copper base alloy and there were between ten and fifteen different such alloys in use in the Foundry. Most of these different alloys required some variation in casting techniques. The number of each type of casting required, at any given time, varied from ten of one type to many thousands of others and these variations in batch quantity determined, to some extent,

¹ In the engineering industry time allowance systems involve:
   A' Basic rate per hour for the operator which will be subject to change as he progresses from one type of work to another.
   B' National Bonus, expressed as an additional rate per hour.
   C' Bonus earned expressed as a percentage of A (not of A+B).
   An operator's wages per week are calculated thus:
   (Hours worked × (A+B)) + (Hours worked × A × % bonus).
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the type of patterns used and the manufacturing technique itself. The foregoing are quite normal features of a bronze foundry; nevertheless, they made assessment of the time work content of different castings difficult in terms of consistency and apparent fairness to the foundrymen concerned.

There was argument about the bonus earned nearly every week when the results of the calculations were declared. It was not uncommon for the committee of representatives in the Foundry to accuse the manager of the Foundry of ‘wangling’ allowances and calculations. Investigations by time study engineers of the Factory Headquarters staff to check the validity of the calculations, were initiated on several occasions and twice these investigations were done in conjunction with a member nominated by the Foundry Committee. Complete descriptions of the basis of calculation were given to the Committee representatives. Such investigations and discussions helped, at times, to reassure the foundrymen but only for short periods; as soon as new types of work or any change in methods were introduced, anxiety and accusations would break out afresh.

Considerable thought had been taking place in the Company amongst some senior managers for many years about wage incentives. It had come to be recognized by a few that rate-fixing always contained a large element of subjective judgment. So long as the study was directed to the ascertainment of a reasonable time allowance for an averagely skilled operator working at a normal pace, then the element of judgment must at least enter into deciding what was in each case reasonable, average and normal.

As Managing Director, I was involved, on frequent occasions, at this time, in discussions with representatives about pay. Gradually it became almost standard practice on my part to draw attention to the subjective nature of the so-called measurement of time allowances. Such reiterated statements were not always taken at their face value and examined. Representatives would say things like: ‘Precisely; that is our whole point.

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The firm’s time study men do not know their job properly and they set time allowances unfairly. We can demonstrate to you that they ought to be different, etc.” One might have expected that once the idea of measurement of time allowances was acknowledged to be a fiction and the fact that they were based on assessment by the time study engineer, fully exposed, then representatives might have proposed other means of payment. They might, for instance, have suggested joint assessment of time allowances by a time study man and a representative, or they might have suggested the abolition of the use of such assessments as the basis of earnings.

In fact, however, giving up of the idea that time allowances could be measured, seemed as difficult to many representatives, at that time, as it was to some of the Company’s managers and technicians. In the early discussions that took place about the idea of taking the bold step of abolishing wage incentives altogether, the Foundry Manager and his sub-managers were alarmed. They suggested that output would fall off drastically because there would be no incentive for people to maintain their rate of output. It appeared to them that difficult as the current situation was, we should be stepping out of the frying pan into the fire if we abandoned this system.

One of the points consistently made was common to all subsequent discussions that took place between managers on the changes in payment methods that were to come later. It was this: when a man is working on a time allowance system and anything happens to interrupt the rate of his own output, he will protest vigorously to his own manager. For example, if the rate at which work is reaching him slows down, if the machine is not working efficiently, if the condition of his sand coming to him from an overhead conveyor is unsuitable, if his pattern plate is not registering properly, etc., he will immediately take up these issues with his manager in order to prevent loss of bonus. If, however, time allowance pay were abolished he would accept these things, they would not come to the attention of the managers responsible for them, output would
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drop, quality would fall and disaster would ensue. I shall discuss later in this paper the effects of wage incentives in allowing abdication on the part of managers from the responsibility of assessing both the conditions of work in their command and the rate of output coming from each of their subordinates. Suffice it is for the moment to describe what happened at that time.

It was made clear to these managers that the proposal to abolish direct wage incentives did in fact mean that a higher degree of responsibility for ensuring that proper conditions of work existed, would rest on their shoulders. Perhaps it was this statement which contributed so much to their concern though subsequently, after the change, it did not seem to be a major matter of difficulty. One of the assumptions made at the time was that the abolition of W.I. pay meant also the cessation by engineers of their work study activities for the sorting out of technical problems and the initiation of new methods. This was, of course, not our intention. It is, however, interesting that in many discussions with managers in other companies about our own abolition of wage incentive systems, practically all of them make the assumption that intensive study of method and output would be dropped also.

I was not prepared personally, as Managing Director, to take a decision to abolish wage incentives in the face of hostility to the idea both from the managers in the Foundry and from representatives. From time to time, therefore, when fresh anxiety and hostility about bonus emerged, discussions took place. The General Manager of the London Factory, within whose command the Foundry lay had, by this time, reached the conclusion that however alarming the possibilities arising from the change I had proposed might look, it could produce no worse results than the continuation of the bonus system then in operation. He was prepared to ‘have a go’ at making some experiments of what, at that time, were of unusual nature. Gradually this feeling permeated the minds not only of managers in the Foundry, but also of representatives. We had, therefore, reached the stage of thinking which permitted a serious examination of the idea of abolishing W.I. pay, and paying men an hourly rate based on a managerial assessment of the level of work on which they were engaged.

The negotiations which followed were prolonged and arduous, leading, at times, to the emergence of hostile feelings on the part of all but eventually the Foundry Committee, helped by their union officials, the Foundry Manager and the General Manager of the London Factory, reached agreement.

On the 23rd June 1949 the General Manager was able to issue a notice from which I quote.

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Foundry Wage Payment System

The method of wage payment in the Foundry has been generally agreed as unsatisfactory. Great difficulty is experienced in setting out fair piecework prices and, with the introduction of new techniques and practices, the whole price structure has become unsound.

The acknowledgment of this situation gave rise to discussions between Shop Committee and Management, from which it was agreed that the introduction of a flat rate system in place of group bonus appeared to be the best solution of the problem. Further discussion and advice from union officials resulted in agreement being reached by Shop Committee and Management, that the proposed flat rates be based on existing rates plus 58 per cent.

In arriving at the figure of 58 per cent, allowance has been made for the increased financial benefit which members of the department will get because of Holiday Pay, Overtime and Nightshift premiums, etc., which will in future be based upon a higher basic rate.

In order to confirm this agreement, a ballot of all members on Group Bonus was held on 15th June 1949, with the following results:

'Do you accept a flat rate equal to your existing rate plus 58 per cent?'
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Flat rates equal to existing rates plus 58 per cent will be introduced for all Foundry members at present on Group Bonus.

It is mutually agreed that any question arising as a result of this change in the method of wage payment within the department may be raised at any time by Shop Committee or Management. Department members have given their assurance that they will maintain their existing effort and co-operate in improving production.

I shall discuss later in this essay the results, in general terms, of this and other changes away from wage incentive pay in our London Factories. Suffice to say at this point that the methods of payment in operation in the Foundry in 1961 are substantially the same as those worked out in the negotiations which I have described.

The Service Department

The change of this department from piecework to hourly rates has already been fully described and documented in Chapter 4 of *The Changing Culture of a Factory* by Elliott Jaques\(^1\) and in two papers published in Human Relations, Vol. III, No. 3, August 1950 and Vol. IV, No. 4, 1951.

The Service Department is a repair and special order shop. The bearings vary in size from six inches diameter to five feet diameter. The department deals with jobbing work and the size of batch is usually very small.

In 1948 the manager of the department first mooted the idea of changing over to hourly rates. He based his case on the fact that Service work did not align itself to W.I. payment, since

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1 Tavistock Publications Ltd., London.

Dropping Wage Incentives

no two jobs were alike. He referred to the fact that both the management of the shop and the operators were concerned about the waste of time and the lowered morale that resulted from the current wage payment system. He called a meeting of all operators and made a specific offer of an hourly rate of a given amount to each operative in the department. During this meeting, the main question asked by operators was 'How would output be maintained when piecework incentives were withdrawn?'

A Wages Committee, composed of representatives, the Manager, the Shop Superintendent and the Shop Accountant, was set up to consider the matter.

At that time, the Glacier Project, which involved the presence in the Factory of a team of research workers led by Dr. Jaques, had just commenced and this committee enlisted the co-operation of the research team 'to obtain advice on how to avoid likely pitfalls'.

The forty operators were divided into five groups of eight, with one representative delegated to each, to discuss the matter with them and obtain a progressive picture of the prevailing attitudes. Members of the research team were attached to each of these groups.

These discussions led to the operators giving instructions to their representatives to negotiate with management a change-over to an hourly wage to be calculated on each individual's existing basic rate plus 65 per cent. Many guarantees and safeguards were also asked for.

As a result of a great deal of discussion a document was drafted, signed by the Manager of the department and the Chairman of the Shop representatives and sent to each operator, which read as follows:

Management started off by considering that the Shop should be ready to accept a slightly lower wage-earning on average because of the advantage of working on a stabilised basis not subject to the hazards of piecework, and because it was considered that production might suffer to some slight extent when
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The direct piecework incentive was withdrawn. Your representatives, however, objected to this view, suggesting that we ought to pay the same amount of wages in the Shop on the new system as on the old, and that it would be up to the Shop itself to give as high an output on the new basis as on the old. Management consider this an extremely responsible attitude to take and accept the principle put forward by your representatives as a basis for discussion.

The principle of payment proposed is that each worker should receive a new flat rate made up of his present basic rate, plus a 57 per cent increment, which is equal to the average bonus earnings of the Shop. This would mean that there would be some levelling out of wages, with less spread between the top and bottom, although an adjustment might be made in the case of a few people where it is considered that injustice would be done by adopting such a basis.

The position at the moment is that you are being asked to come to a decision as to whether you would regard the basis outlined above as being satisfactory in principle. There are still important matters to be solved and discussions are continuing on these. They are mainly: the need to preserve a correct relationship between rates earned in the Service Shop and by other Departments, such as Tool Room and Millwrights, and we are proposing to ask representatives of these shops to discuss this issue with us. Furthermore, we have to consider to what extent, if at all, there should be any adjustment in rates established on a new basis in accordance with falling outputs, or alternatively, increased output, whether this arises from greater or lesser productivity on the one hand, or greater or lesser volume of work on the other. Subject, however, to final decisions on these issues, we should like to know if you think the general basis proposed would be satisfactory. On this proposed new basis your own new rate would be as shown on the bottom of this note. [The actual rate for each individual was appended.]

A ballot was held on the 19th May and the shop voted unanimously to have their representatives carry the matter further.

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At a subsequent meeting, the Chairman of the Representative Committee produced a list of points raised during the group discussions which ran somewhat as follows:

PAY PACKET ISSUES
(a) Negotiate on a 65 per cent basis.
(b) Take up who gets the savings on overheads.
(c) The rates and adjustment on rates if production goes up.

SAFEGUARDS AND GUARANTEES
(a) Make sure the pay packet agreed will be protected.
(b) Get a guarantee of no change back to piecework at a lower rate.
(c) See that Service Department rates will not set a precedent for other departments, and that if any other departments negotiate a higher rate Service Department negotiations can be re-opened.
(d) Make sure of satisfactory conditions of work with a minimum of interference from supervision.
(e) Get security for special individuals, such as sick, or older people or slower workers.
(f) Arrange proper facilities for workers to increase their skill.

GENERAL MORALE ISSUES
(a) Get out the causes of the present disharmony in the department.
(b) Cannot the shop be more independent from the rest of the works as it used to be.
(c) Find out why the section supervisors seem to be more driven and less cordial.
(d) Take up why the management does not trust the shop to keep up production.
(e) Find out if management has anything up its sleeve.
(f) If the workers do not want the scheme will it be forced upon them?
(g) If the scheme is accepted before the summer holidays will members taking holidays before the scheme is implemented be reimbursed?
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These points were discussed and worked through and a ballot took place in which 70 per cent of the operators voted in favour of a changeover. Before the new system of wage payment could be implemented, one or two additional hurdles had to be cleared by further meetings but, on 28th June, the new method of payment was implemented.

Subsequently the research team spent a considerable time investigating the result of the change, and these have been fully written up.1 Many interesting observations resulted from this follow-up but no quantitative statement of the effects of the change on output was obtainable. The following is an extract from the Summary and Conclusions of the Report issued by the Research team.

We have presented some of the results of a two-year follow-up study of the impact on the Service Department of a change from piece rates to flat rates. The data were not systematically obtained. They were collected in the course of a continuing working-through process in connection with the resolution of group stresses.

The quantitative data give inconclusive results. Accurate measurement of changes in productivity (in the sense of workers’ effort) proved impossible, for at the same time there has been a tightening of quality standards, and some change in the character of work. . . . At the same time, there is evidence to show that the model behaviour of the workers in the shop is to ensure that the workers hold their own end up. The trend of the value of the mode and the targets of individuals suggest a responsible desire among the workers to maintain their output.

The new system of payment is favoured by both management and workers. Management find much greater flexibility in organizing their work, and workers feel that skill is better recognized than under piece rates. . . . There was no apparent change in labour turnover, and no marked tendency for those who dropped in earnings to leave.

Other adjustments to the changeover were required which were found to be of considerable importance. Under piece rates

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part of the responsibility for supervisory control could be disowned and the piece rate mechanism itself used as a kind of impersonal control. With the change to flat rates this seemingly impersonal mechanism was removed, and superiors were faced more directly with the task of leadership of their subordinates.

The Thin Wall Unit

This department was responsible predominantly for the production of half bearings for the crankshafts of automobile engines. From its inception the machinery has been mainly arranged in ‘Product Lines’. The method of payment of machine operators was, until 1951, group time allowance. A production line was allocated a ‘run’ of a particular type of bearing to manufacture. There had been established by time study and experience for each design, a targeted time allowance within which defined quantitics of bearings ought to be produced. A system of ‘allowances’ to cover time spent in changing over the line from production of one type to another, or for mishaps beyond the control of the operators on the line, was also in operation.

The level of effort in the Thin Wall Unit was consistently regarded by its managers and supervisors as very good and, on the whole, the 200–250 people employed within it seemed enthusiastic with good esprit de corps, but this otherwise fairly happy situation was continuously marred by the varying level of weekly bonus earned. There were several different components to this difficulty:

(a) The bonus earned by a given line showed significant fluctuation from week to week. When it was low there was, of course, marked disappointment and anxiety on the part of the operators affected and also on the part of the supervisors on the line to whom low bonus spelt trouble.

(b) Over long periods, some lines managed to sustain a substantially higher rate of bonus than others. For example, some

1 Human Relations. Volume IV, No. 4, 1951.
lines manufactured ‘flanged’ bearings and others ‘unflanged’ bearings. I remember during the last war conducting a review of these bonus problems and being presented with data which showed that unflanged bearing lines all earned substantially more than flanged bearing lines. Operators felt that to be posted to a ‘flanged’ line condemned them to a period of low bonus and vice versa. There was strong feeling about the unfairness of the targets set for flanged types of bearings.

About a year later I had cause to conduct a second review of the position and was surprised to observe that it had reversed itself. Unflanged lines had become unpopular because of low bonus and postings to flanged lines were now sought after as a sure way of earning high bonus. My first assumption was that adjustments in targets had been made, but this was not so; targets, as far as the jobs common to the two periods were concerned, were the same from one year to the next and had remained virtually unchanged. The departmental manager held the view that it was a psychological result. The previous year everybody had felt that flanged bearings could not be made to yield high bonus until a section supervisor had been able, by suitable encouragement and by attention to tools and other means, to get output up to a new level which earned really high bonus. This result immediately demonstrated to the other flanged lines that it could be done, despair was shaken off and they ‘had a go’ to discover that it was possible. In so doing their bonus rose above the unflanged line bonus level; this seemed to dispirit the unflanged line operators who gradually assumed the same attitude of despair as had previously pertained to the flanged line operators. Later the position reversed itself again.

(c) The fact that there was a very high rate of posting of operators from one line to another in response to the pressure arising from the different mix of the demand for various types of bearings. This meant that an operator who had got nicely settled on a line, attached to the rest of the crew operating it and earning good bonus, might involuntarily find himself posted for weeks to another line where bonus was consistently low.

The type of problems referred to were raised by operators with supervisors and by the committee of representatives in the department, over many years. There were discussions, investigations into methods of setting targets, concessions on targets and much study of methods to alleviate each situation as it arose, but as soon as matters seemed to have settled down, the introduction of new machinery or tools or different types of bearings soon started up trouble all over again.

The problems of bonus earning in this department were discussed frequently by the London Factory Works Committee of Representatives and raised them at Works Council in March 1944. 'It was stated that discontent existed in the Line Shop as a result of the Line Production system as at present constituted being either wholly or partly wrong in principle.'

Discussion centred round such problems as the separate dayshift and nightshift bonus assessments, short orders, setting-up time, discontent arising from psychological causes, flow of work, etc. A strong sub-committee under the chairmanship of the General Manager London Factories was set up by Council to investigate the points raised and make proposals for change. In spite of the serious study and attempts at solution, the problems remained with us.

In 1951, in the light of the experience gained in the Foundry and Service Department, the General Manager of the London Factory sought my agreement to start negotiations towards the elimination of the wage incentive system in the department. The basis was that the Company were prepared to introduce any change in the methods of paying operators which could be agreed as between this Committee and the General Manager, as long as the average sum of money per employed operator earned was not increased.

Prolonged discussions took place between the Thin Wall
Unit Committee of Representatives, the Manager of the Unit, the General Manager London Factory and the Company Personnel Director. In June 1951, the Personnel Director issued to each hourly-rated person in the Department a 2,500-word proposed scheme, of which the following is a précis:

(a) Your rate, if this scheme is adopted, will be . . . per hour, giving you a weekly wage of £ . . . for 44 hours’ work.
(b) The scheme abolishes all payment by result.
(c) Shop management will conduct regular wage reviews of all persons in the department; in the case of new entrants, these will take place twice within the first three months of joining the department. Management will decide change in individual hourly rates on the basis of skill, ability and personal factors.
(d) Three groups of jobs are to be established, as follows:
[Here follows a definition of the three groups, together with their respective hourly rates.]
(e) Management may award in excess of the maximum rates named in cases of exceptional ability.
(f) Persons promoted from one group to another may be demoted if they fail to reach required standard.
(g) All overtime premiums, nightshift allowance, holiday pay etc., to be computed on the total consolidated rate.
(h) The scheme may cause a sharp drop in earnings to a few operators in the department. Management undertake to consider each such case and, if merited, award a special increase which will gradually be extinguished by future advance in pay levels.
(i) Output targets and measurement of output to be simplified and fully maintained. Time allowance for breakdowns, setting and starting up to continue, not for purposes of payment, but to enable efficiency to be measured.
(j) Shop Committee to be provided with details of production targets and output, methods of manufacture and cost data. Changes in methods and new machinery to be the subject of discussion with the shop committee.
(k) Management undertake to extend and increase the amount of training given to operators in the acquirement of basic workshop knowledge.

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(l) All members of the department to ballot in the proposals which will be implemented if 75 per cent or more of the votes cast are in favour.
(m) If the proposals are adopted, continuance or discontinuance shall be subject of further consideration after they have been in operation for twelve months.

These proposals received the necessary majority in the ballot which followed and the scheme was brought into operation. At a subsequent review with the Shop Committee twelve months later, the decision to operate it was confirmed. The methods of payment adopted at that time are, substantially, those in operation at the time of writing in 1961.

The Thick Wall Unit

This unit employed some two hundred and fifty persons and was commanded by a Production Unit Manager, with the assistance of Technical, Programming and Personnel Staff officers. Subordinate to him were seven section managers, most of whom had the assistance of supervisors in taking command of groups of craftsmen and operators varying from fifteen up to fifty people.

This production unit had deep associations with the past. Until 1914 all the finished bearings made by the Company had been produced by pressure diecasting in the Diecasting Department. About 1918 bronze backed bearings lined with white metal were manufactured and this brought B2 Department into being. Market demand for larger types of bearings were responsible for the formation of B1 and B3 Departments.

These four departments embodied many of the men and women who possessed the longest service with the Company. The techniques of production used had undergone less change because, when new types of bearings or basic change had been required, new departments had been formed or new factories built to house them. Thus, as far as we had an embodiment
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of our traditional past, it was the Thick Wall Unit. The character of the people in this unit had always been marginally different from those in other parts of the Company. The average length of service with the Company was relatively high. Steady reliable work was always done. The representatives elected by the department were usually very mature people with long service who took their representative responsibilities very seriously. They tended to think not only of the short term interests of their constituents but also of their much longer term interests in the light of the future of the whole production unit and of the Company itself.

Because mass produced engines used thin-walled bearings, which were made elsewhere in the Company, the work of the Thick Wall Unit had become increasingly concerned with the manufacture of small batches of bearings with growing emphasis on the larger sizes of up to thirty inches in diameter. Most of these were of relatively complex design, as compared with bearings made elsewhere in the Company, involving a large number of different operations. It was for these reasons that group wage incentive systems had never been possible. Payment had been based on time allowance set in terms of the standard hours required to complete different operations and operators had earned bonus as individuals.

In 1951 when the Thin Wall Unit gave up group bonus, there was a good deal of discussion between management and the three committees of B1, B2 and Diecasting Department about changes, but these came to naught. On two or three occasions between 1951 and 1959, collaborative attempts were made to work out schemes for change but these either fell through during discussion or were rejected by ballot.

All of these early negotiations were characterized by good relations between managers and representatives. I have no recollection of any friction for instance, developing when, after a period of discussion on proposed changes, it proved impossible to come to a workable agreement.

The situation was somewhat paradoxical. The Thick Wall

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Unit appeared to be par excellence the one which would have benefited most from such a changeover. The wide variety and complexity of the work made the piecework system much the most complex of any operating in the Company. The system of 'Additional Wage Issues' was hair raising in its complexities and niceties. Setting up and starting up allowances were very difficult to administer fairly and called for a high level of understanding and tolerance on the part of both managers and operators. In spite of these difficulties the W.I. system of payment endured longer than in any other department.

One is, of course, merely guessing when one talks about the motives of others, but it seemed to me that the facets of the situations which eventually brought about a concensus of opinion favourable to the elimination of wage incentive pay on the part of the operators was not a sense of its unfairness, not a feeling of being paid inappropriately, but the effect of the piecework system on allowances for nightshift, overtime work, holiday pay and the Company sick pay plan.

Piecework involves:

A—A basic rate per hour.

B—National Bonus expressed as an additional rate per hour, and

C—Percentage bonus earned of A.

An operator's wages per week are thus:

\[
(\text{No. of hours worked}) \times (A + B)) + (\text{Hours worked} \times \text{percentage bonus} \times A),
\]

this calculation being common practice in the engineering industry.

Now consider two operators, Mr X and Mr Y. Both, in a standard week of forty-two hours earn £12 12s. Od. Both, therefore, are, on average, earning 6s. per hour.

Mr X is not on wage incentive pay and 6s. per hour is his actual rate of pay. Mr Y works on a time allowance system but, although his earnings per forty-two hours work out on average at 6s. per hour, the fixed part of his wage is only 4s. per hour. The basic feature of the method of calculating all
allowances for overtime, nightshift, holidays and sickness, is to multiply the fixed part of the operator’s wages by the appropriate percentage allowance.

For example. If Mr X works overtime on Saturday he earns (6s. + 50 per cent overtime premium) 9s. per hour worked, but Mr Y, on wage incentive, earns (4s. + 50 per cent overtime premium) 6s. per hour worked, plus output bonus. Mr X’s pay for a Bank Holiday is \( \left( \frac{42}{5} \times 6s. \right) \) that is, one day’s normal pay. Mr Y’s Bank Holiday pay is \( \left( \frac{42}{5} \times 4s. \right) \) He does not earn output bonus on holiday. (In recent years the problem has been taken care of to a limited extent by the payment of about 33\(\frac{1}{2}\) per cent of base rate in an endeavour to help the pay of the pieceworker on holiday but, of course, if high bonus rates have been earned, pieceworkers are still at a disadvantage.)

Thus, when the nightshift allowance was changed by National Agreement some years ago from 20 per cent addition to 33\(\frac{1}{2}\) per cent addition, every operator in the factory was pleased, because most of them, at times, have to take a turn on nightshift. For those in the Thick Wall Unit, however, the pleasure was marred by the thought that the amount by which their nightshift allowance fell below that of the flat rate workers, had been still further increased; this type of deterioration of their position taking place each time there was an advance in the rate of allowances. This then, I believe, was the main stimulus for readiness to negotiate a change to flat rate. In July 1959 a formal proposal was put forward by the Unit Representative Committee for a general increase of the basic wage brackets pertaining to the various groups of occupations in the Unit. The discussion which followed displayed the fact that although, owing to the operation of piecework, some members of the Unit were earning rather modest wages, others were consistently taking home relatively large pay packets. If wage brackets were altered to assist those earning the smaller pay packets, it would still further increase the wages of those already felt to be earning at a very satisfactory level. It became clear, yet again, that the lack of predictability and relation of actual earnings with level of work done in a wage incentive situation, would make it exceedingly difficult for management to agree to any changes in basic hourly rates. Discussion then started veering towards the abolition of the time allowance system.

In September 1959 I resigned from the position of Managing Director. My successor carried through the complex and difficult discussions which resulted, at last, in agreement to submit to all the operators in the unit, for decision by a ballot, a proposal for a change to flat rate system of paying wages.

The documents issued to every operator in the Unit, in November 1959, covered three pages and the following is a précis of their contents.

(a) You will be asked to record your vote concerning the transition of the Thick Wall Unit from piecework to timework method of payment. If the necessary majority vote in favour, your new pay and allowances will be as follows:
Overtime Rate ...
Nightshift Rate ...
Sick Pay and Hourly Rate ...
This hourly rate for you has been based on your Section Manager's assessment of the level of your job in relation to others.

(b) The following Schedule of Minimum and Maximum Hourly Rates for the various types of job is part of the proposal. These rates will require final ratification by the London Factories Works Council.
[Here follows a description of five different kinds of work and their respective pay brackets.]

Perhaps the most important part of the proposals covered operators who, under piecework, had earned exceptionally high rates of bonus. The payment to such operators of an
hourly rate within the bracket appropriate for the level of job which they had been doing, would have resulted in a very substantial drop in earnings per week as against the average which they had been earning.

The hourly rate assessed by the section manager for such men, had added to it an adjustment figure expressed in pence per hour. The proposal was that this xd. per hour would be paid for one year; thereafter it would be reduced over four years to 2d. per hour. This 2d. per hour would be paid so long as the operator remained in the Thick Wall Unit.

The proposal closed with two statements:

(a) That it was made on the understanding that every operator would continue to work with comparable effort if the change-over took place.

(b) Reminding all operators that, using the Company appeal mechanism, they could challenge at any time the time rate at which their managers had assessed them.

The ballot was duly held and, 90 per cent voting in favour, the change was implemented.

Changes of a similar nature had been proceeding between 1949 and 1953 in the Company’s Kilmarnock Factory which had, by the latter date, eliminated wage incentive systems altogether. Thus, the agreement with the Thick Wall Unit in London signalled the closing down of all wage incentive systems in the Company.

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**Results of Change to Hourly Rates**

The reader may be expecting this section to comprise a series of mathematically expressed comparisons of the output, in the departments described, before and after the change in basis of pay. I am sorry to disappoint him but, for reasons which I shall explain, it is not possible in dynamic situations to make such statements.

To clear the air let me first say that as far as could be judged there was not, in the cases under review, any significant change in output.

Suppose I had said that in Machine Shop A the output before the change was 1,000 standard hours and after the change it rose to 1,100 standard hours for, say, eight-week averages in both cases, the assumptions made by the reader might well have been ‘output rose by 10 per cent as a result of change of payment method’. This would clearly have been a quite unjustified assumption unless it were also true that, for instance:

(a) The number of operators and the number of hours worked had remained the same.

(b) There had been no change of occupancy of the work roles in the department, i.e., that we were considering the same population of people.

(c) That the type and mix of work had remained unaltered.
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(d) That the way the standard hour content of each job done had been calculated, had remained unaltered.
(e) That there had been no change in the supervisors and managers running the department.
(f) That the physical environment of the operators had remained the same.
(g) That the machines, tools and techniques used in the department had been the same before and after the change.

In general terms, the assumption would have been correct only if every other factor in the total environment of the operators concerned had been constant in the two periods. Clearly, such static situations do not exist in any ongoing organization.

Thus, if other factors are changing at the same time, it would be equally valid to attribute any change in output to those other factors rather than to the change in payment methods.

There is one particular variable in these change of payment experiments which can easily be overlooked but which is very important. Work done is commonly assessed by expressing all the output results of that work in terms of a common denominator, such as standard hours. Consider the situation of the person responsible for assessing the standard hour content of different products or operations before and after a change from wage incentive basis. Before the change, pressures will be high towards over-valuation and these pressures will be, to some extent, removed after the change. Thus, even the yardstick for measuring output itself, may change.

The majority of both managers and operators seemed, as individuals (I stress as individuals because representatives speaking of the feelings of operators as a group held a contrary view) to be convinced that output would drop sharply if W.I. payment was abandoned. Such a result appeared to many to be quite inevitable. ‘It stands to reason’ was an expression much heard. The result demonstrated the falsity of the expectation that the type of wage payment system in use was a predominant variable in the situation. As far as both managers and operators could judge, there was no significant change in output.

As already pointed out, one serious attempt was made (in the Service Department changeover) to measure the results of dropping piecework subsequent to the event. It had, however, to be given up because owing to the dynamic situation within which changes of this sort are made, measurement proved to be impossible.

Though, therefore, I can provide no statistics of any value, I can give my own evaluation of the results and can quote other people.

About a week before one of the wage system changes referred to in the previous section was introduced, the manager of the department asked if he might have an informal chat with me. I was Managing Director of the Company at that time and he was not one of my immediate subordinates, but he was a highly trusted and experienced man, and I invited him to come and see me in my office. What he said was, in effect, as follows:

I know, Mr Brown, that you do not believe that wage incentives are a good idea, I know that in the departments where they have been abolished the change has worked out well, for I have met the managers of those departments and discussed the matter with them. I know that my Shop Committee are agreed on the change and I am formally in favour, too, because you and the General Manager of the London Factory want to see the change go through. I think, however, that it is my clear duty to tell you that you are about to take a step which you will regret and which is not in the best interests of the Company.

My Department is different from the others, people in it work hard and one of the reasons is because of the group bonus system. I am sure, because I have been in the Department for some years, that though the change may produce a happier department, you will lose output. My people are just not going
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to keep up their present rate of working if there is no bonus at
the end of the week. They work hard because of the excitement
of trying to maximise bonus, and without that incentive we
shall lose a lot of output.

This was not a dichard manager clinging to tradition. He
had thought it all out very seriously and, in talking to me, was
doing what he thought as his duty. We had a long discussion and
I thanked him for his sincerity but told him that I thought
events would prove him wrong. The change took place.

Some three months later the same manager came down to
see me again in my office, and the following is a précis of
what he told me:

I had to come and see you to say that you were right about
the bonus scheme in my Department, and I was wrong. I
wanted you to know that experience on this matter has changed
my attitude to wage incentive schemes. Many of us have been
thinking about wages and production in over-simplified terms
for far too long. My people are working just as well as they ever
worked and, because I and other managers in the department
have no longer got to spend so much of our time thinking about
how much bonus people will earn at the end of the week and
all the emotional trouble that will arise if it is low, we are able
to think far more about production problems. This is enabling
us to get more output with operators working at the same pace.

I realized that the change was sound on the first Friday
afternoon after it had been introduced. Each Friday at 4.30 p.m.
when the dayshift shuts down, I and my section managers have
a meeting in my office. In the days of bonus I used to ask each
of them in turn what the results of his section was in terms of
bonus earned. Some would be high—they were all right; some
were low—these were the trouble spots for the following
week when the bonus results were announced. We discussed
each section with low bonus in turn at some length. How many
‘set-ups’ for change of type of production had taken place? Had
the correct allowance been given? Was the low bonus justified
or had there been undetected circumstances outside the group’s

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control for which adequate compensation had not been given?
The whole focus of attention was around trying to keep the
operators satisfied.

My first Friday afternoon after the change was dramatically
different. There was no bonus to talk about. I asked each
section manager about his output instead. How many bearings
of a different type had he produced? We started a long dis-


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per line. This increase has been brought about with new machinery manufactured in the London Factory, tested and installed in the departments with the co-operation of operators. At times, a natural enthusiasm for progress of this sort has led representatives to get critical of the slow rate at which it has been introduced. At other times there has been deep concern about the lack of career opportunity in the Department, but we have been able to arrive at amicable solutions.

In the Foundry we had begun a large programme of change of plant and layout of the Department soon after giving up the group time allowance scheme; new furnaces, a different conveyor for moulds, new moulding machines, new sand conveyors, moulding boxes weighing 60 per cent more than the previous boxes, etc., all designed to achieve a 60 per cent increase in output. We achieved the new target output without much trouble. The many varied changes in method were accepted and put into practice with goodwill by the foundrymen. During the introduction of this programme there were, of course, problems raised by representatives, but these were discussed and solved with the foundrymen, untrammelled by that deep and anxious hostility which had hitherto characterized any change in the department. The endless arguments and the general atmosphere of hostility over the weekly bonus had gone.

Other similar changes from some form of wage incentive scheme to hourly rates, which I have not described, took place between 1949 and 1953. The Press Shop in London changed over, as did the entirety of our Kilmarnock Factory. No departmental manager and no factory manager has, so far as I am aware, ever expressed a desire to reintroduce wage incentives. Most senior managers quite specifically say that it was one of the best changes we ever have made. One new manager, appointed at senior level in the early 1950’s, was unaware, by oversight, before he joined us that we were not, in general, using wage incentive systems. This concerned him very much indeed, and he came to see me to argue the case for them. I asked him to suspend his arguments until he had had six months’ experience of our Company. He became later an ardent supporter of the idea of eliminating wage incentive methods of payment in the organizational and managerial circumstances in which we had introduced the change.

Representative committees in two departments have, on two or three occasions, raised the issue during periods when negotiations about wages have been in progress. They have claimed that because, under the old system they used to average, say, 60 per cent bonus, that to-day, because they are clearly working harder and producing much more, they would have been better off had they retained the wage incentive scheme and, therefore, hourly rates should be higher. So many changes in personnel, plant, methods and organization have taken place in the interim that it is not possible to sustain the argument, but the way in which they raise it is interesting.

The Thick Wall Unit was the last department in the Company to give up a wage incentive scheme. Prior to the change I, personally, had been becoming increasingly worried about the apparent level of effort in the Unit. Not for many years had I felt such anxiety. There appeared to be more machines standing idle, less vigorous activity, more of those small ‘conferences’ going on in the department among operators than I had seen for some years in any of our machine shops. In departments where wages vary with output, ‘current theory’ suggests that operators do not waste time because it affects their wages. If ‘current theory’ had been correct, this oasis of wage incentives would have looked the busiest part of the Company, operators would be more active at the start and finish of the shift than in other departments where the ‘vital stimulus’ had been removed. But, as far as I could see, the reverse was rapidly becoming true. After the changeover I noticed a marked difference. The departments of the Thick Wall Unit looked more active. I agree that the wish may, in my case, have been the father of the observation, but I record
my impression, and I was not alone in the feeling. Output assessed in standard hours in the Thick Wall Unit, per real hour worked has, over the last eighteen months, risen. I am not suggesting that this rise is a result of the change in wage system, because much reorganization of work has taken place, mostly centred around geographical regrouping of plant, more concentration of particular types of work in specific departments and better programming. It is clear, however, that the previous method of paying wages might well have rendered the reorganization more difficult and that the new wages scheme has not inhibited rise of output.

Summarizing, I would say that these wage changes have had no discernible effect on output but they have provided the following advantages:

(a) Release of managerial time from concern with bonus, made possible increased attention to the real production problems of tooling, machines, flow of work, training of operators, reduction of scrap, etc.
(b) Decrease of clerical work on the part of operators, supervisors and clerks in such places as the departmental office, the wages office and the cost office.
(c) Decreased resistance to change of production methods, introduction of new plant or reorganization, on the part of operators.
(d) Fuller achievement of the potential increase of production from the introduction of new methods.
(e) Greater freedom of action for managers in distribution of work between operators.
(f) Responsibility for the assessment of the appropriate level of pay for each individual operator can be placed squarely on the shoulders of their managers. Because they have hour-to-hour contact with operators, they are in a better position to judge performance and pay of operators instead of leaving such important matters to the variations arising from time study of samples of work.
(g) Decrease in feelings of hostility and suspicion between managers and representatives.
(h) Freeing those responsible for setting work targets and devising new methods, from the anxiety of having to consider all the time the effect of their judgments on the weekly earnings of people.
(i) Reduction of difficulty in taking on recruits for operator jobs because, instead of offering applicants a relatively low hourly rate and an opportunity of earning bonus, employment officers can make quite specific statements about starting hourly rates, wage reviews and the wage brackets in operation on various jobs.
(j) Elimination of some of the problems surrounding the manufacture of samples, special jobs or experimental work. On these it was necessary to employ the most skilled men in the department on hourly rates, paying them some customary rate of bonus as compensation; but these men frequently felt that the bonus allowance was insufficient and there was often feeling and trouble.
Organizational Implications of Change to Hourly Rates

During a visit to Germany in 1933, I was told of the historical system by which scissors were made. It had been a cottage industry. An entrepreneur would set up in business to organize the making and selling of scissors. He purchased the forgings and the villagers in the area would contract, family by family, to ‘finish’ specific quantities by working on them in their cottages at a fixed price per pair. These were handed back to the entrepreneur who would box them and sell them. So it was also in the needle industry in this country. In the Clyde shipyards, a gang of men used to be paid piecework for such jobs as drilling ships’ plates. Here they worked in the employer’s premises, used his machines, but were paid as contractors. The ‘ganger’ received the contract price for the work done at the end of the week and distributed it on some agreed basis among the others in the gang.

My reason for mentioning these well-known features of industrial history is to point out that under the original circumstances of piecework, there often was no manager-subordinate relationship between those doing the physical work on the product and those organizing its development, manufacture and sale. The ‘operators’ were more akin to sub-contractors than to employees.

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The changeover from the sub-contractor role to the employee role has taken place over perhaps a hundred years but the traditions of the former role are not yet entirely given up.

Managerial Control

Industry has not chosen, so far, to give precise meaning to the term ‘manager’. This, in my view, is exceedingly unfortunate as I shall try to show.

In any company, one has a hierarchical structure of work positions amongst which the entire work of the company is divided up. I shall call this an Executive System. One of the properties of an executive system is that many of the positions within it are allotted more work than one man can possibly perform personally. Thus, such a man, has subordinates to whom he allots part of his work. Now, the property which is of especial interest for my current purpose is that such a man is responsible for the totality of his work whether or not he has done it personally. He takes responsibility for the work of his subordinates. When something goes wrong he does not excuse himself on the grounds that one of his subordinates has let him down. I have never met any experienced person who challenges this statement of the nature of executive systems. Given that property, it is possible to derive from it a definition of managerial authority. If a man is to be held responsible for the work of another, then he is that man’s manager and, minimally, managerial authority consists of the right of the manager to choose, assess and, if necessary, decide that a person is not good enough to remain as one of his subordinates.

I have defined elsewhere the meaning given to the term ‘Managerial Authority’ in The Glacier Metal Co. Ltd., as follows:

The minimal authority attached to a managerial role which

1 Exploration in Management, Heinemann Educational Books Ltd., Chapters IV and XIV.
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has to do with control of work by subordinates, i.e., that a manager must have subordinate roles into which he can appoint members, from which he can remove them and within which he can set terms of reference and determine differential rewards.

This minimal authority is not, of course, absolute. Choice of subordinates will be from amongst perhaps a small group acceptable to the company; the right to assess subordinates may mean no more than the putting of them in order of merit from the point of view of their differential pay, and the right to remove a man from a subordinate position must be subject to clear rights of appeal to make certain that the manager has given fair warning of intention and has not allowed improper considerations to affect his judgment.

In spite of these limiting conditions we have defined managerial authority in such a way as to enable us to discover by some simple questions, whether or not a person is a manager within the meaning of this definition.

This is clearly the essential nature of the managerial task, for to deprive a manager of such minimal authority is to deprive him of that control which enables him to accept full responsibility for the manner in which his subordinates discharge the work he has delegated to them. Selection of candidates to fill vacant roles and the process of deciding that a subordinate is not capable of doing the job well enough to retain the position, are usually widely spaced occurrences in the on-going task of a manager. Day-to-day managerial work is concerned with allotting work, fixing targets and dates, deciding methods and assessing the results of the work of subordinates. Wage incentive systems, however, tend to set up circumstances which are inconsistent with such managerial subordinate relations because they have concealed within them the more independent entrepreneur-sub-contractor relationship. In that relationship, the sub-contractor, working in his cottage, got no more piecework contracts if his work was bad or he was late in finishing it. In one sense he was discharged. If he thought the piecework price was unfair, he did not take on the job, he could bargain his way into a better position or he would take on piecework offered by somebody else. In other words merit or lack of it was recognized through a bargaining process. When the worker ceases however to be a sub-contractor then either a manager-subordinate relationship has to be established or else bargaining continues between the operator, who has now become an employee, and the company.

This bargaining situation is characteristic of W.I. systems and it has seemed to me that wherever they exist managerial control is at a discount. The fabric of control and co-ordination is loosened. The sequence in which jobs are performed ceases to be wholly at the dictate of what is optimum for the company’s manufacturing programme; new methods are delayed; the distribution of work between subordinates ceases to be based entirely on who is available or who can best do it; assessment of progress of operators in a holistic sense is substituted by a consideration of his record of bonus earnings; subordinates are not criticized for unnecessary loss of output because, in one sense, they are ‘paying’ for such loss themselves. This abdication of the full managerial-subordinate relationship seems to me to stem partly from wage incentive schemes.

It may be suggested that to make an operator feel more like an independent business man is good, but I doubt if such an argument can be seriously sustained. In a small, simple business perhaps; but in the highly complex larger firm of to-day it is not possible to co-ordinate the work of thousands to produce complex products to exacting specifications in predetermined quantities on due date and, at the same time, to expect the foreman to be responsible for his part in such operations without the minimal authority and responsibility described in the foregoing.

Some may say that in the absence of those on the shop floor who can or will assume the full managerial role, it is surely
better to have some economic mechanism like a piecework system which does compensate for the lack of managerial control by its direct appeal to an operator's own economic sense. Maybe; but this is not an optimum aim to pursue. What is necessary is to institute full managerial roles in charge of operators and that, surely, should be the aim.

There is an analogy in the use of time clocks. It is customary for operators to clock in at the start of the shift; if they are late, they lose pay. In such a situation, a manager can easily rationalize his abdication from the task of calling to account those who are late. He can say: 'They have lost wages through their lateness—it has been brought home to them, they have been penalized, why offer criticism into the bargain?' But the company is not compensated for the loss of output it has suffered by the operator's loss of pay, for his absence has affected the work of others, a machine has stood idle, a programme of work has been affected, and so on. Nevertheless, this rationalization is widespread; foremen and others do take up this attitude. Men continue to be late regularly for work without any realistic appreciation of the effects of such habits. 'What's wrong,' they say, 'true, I am often late, but I am not paid for the time I lose. Is not that fair enough?' Chapter 7 describes in detail how the company abandoned the use of time clocks.

The same type of managerial abdication vis-à-vis assessment of the advancing capability, skill, reliability and future potentiality of each subordinate operator, is encouraged by wage incentive schemes. The implication of a time allowance system is that each can earn in accordance with his own ability, if left to get on with the job. This, however, is a naïve assumption because it leaves out of account the necessity for assessing the level of work most appropriate for each individual operator and it places unrealistic reliance on the accuracy of ratefixing. Thus, real responsibility falls between two stools; managers assume there is little necessity for sophisticated assessment of people and level of work and wage incentive systems fail to compensate for this abdication of managerial responsibility.

On the basis of the foregoing considerations, I now hold the view that the elimination of wage incentives implies a substantial degree of organizational change. I will describe three such implications as follows:

1. **Full Managerial Roles**

The setting up of full managerial roles in charge of operators, so that whatever the title given to such a manager (be it foreman, supervisor, section manager, etc.) he can be held responsible for:

(a) Knowing each of his subordinates as an individual person; being aware of his strengths and weaknesses in his job, understanding something of his aspirations, and forming a relationship with him within which mutual regard and tolerance can grow.
(b) Criticizing his subordinate when his work or conduct falls below the general standards set by the company and the more specific standards which he himself sets.
(c) Making continuous assessment of the level of work which he is allocating to his subordinates and paying his subordinates at a rate consistent with that work as far as he is able with the bracket of hourly rates available to him; seeking agreement from higher managers to a change in these brackets if he feels that they are inconsistent with the work his subordinates perform.
(d) Acknowledging growing individual capacity in his subordinates by delegating work at a higher level to them; or assisting a subordinate whose level of capacity has progressed beyond the level of work which he (the manager) has available, to obtain a position in another section of the company where such higher level work is available.
(e) Deciding, when a subordinate's work is not acceptable,
what steps to take in order to try and improve his work performance in terms of frank criticism, personal tuition, change of terms of reference or further training; deciding, when such an approach has not been successful, to tell the subordinate that he cannot retain a position in his command and reporting the situation to his superior in order that his rejected subordinate may be considered for and, if possible, offered other posts.

In short, inherent in wage incentive systems is the notion that they make the setting up of full managerial roles unnecessary. My own experience, and that quoted quite consistently by other managers, is that the behaviour engendered in operators by wage incentives is far from being consistent with the needs of complex work situations. Managerial control of work and subordinates is, therefore, required whatever the basis of paying wages. Whereas wage incentive systems encourage the abdication by managers of their full responsibilities, the elimination of such systems emphasizes the need and makes easier the institution of full managerial roles at shop floor level. Elimination of wage incentive schemes thus brings a requisite need of executive systems sharply into focus.

2. Wage Brackets

The second organizational change implied by the elimination of direct wage incentives, is concerned with an institution for setting up and reviewing the brackets of hourly rates attached to various types of work.

The underlying principle of both piecework and time allowance systems is to relate earnings to quantity of work done. Piecework merely sets a price and, presumably, if the level of the work is high then the price is set high in order to attract on to it persons of high-level capacity. Time allowance systems usually contain provisions for varying basic rates to be paid to operators according to their level of personal skill but the emphasis tends to be on reliance on the incentive system to provide its own reward for personal capacity.

Thus the emphasis on relating pay to quantity of output tends to inhibit thinking about appropriate means of relating pay, on the one hand, to level of work and, on the other, to equating the level of work to be done to the level of capacity of the operator. Elliott Jaques, in *Equitable Payment* ¹ has made us sharply aware of this triangle of considerations and graphically illustrated them in the following diagrams.

\[
\begin{align*}
C &= \text{capacity of the person in the role.} \\
W &= \text{level of work of the role.} \\
P &= \text{pay.}
\end{align*}
\]

\[
\begin{align*}
P_1 & \quad P \\
C & \downarrow \\
\quad & P_2 \\
\quad & W \\
P & \downarrow \\
\quad & P_3 \\
\quad & C \\
P_4 & \downarrow \\
\quad & P
\end{align*}
\]

Fig. 1

\[
\begin{align*}
P & \quad P \\
\quad & W \\
P & \downarrow \\
\quad & P_3 \\
P & \downarrow \\
\quad & C \\
P & \downarrow \\
\quad & W \\
P & \downarrow \\
\quad & P
\end{align*}
\]

Fig. 2

\[
\begin{align*}
P & \quad P \\
\quad & C \\
P & \downarrow \\
\quad & W \\
P & \downarrow \\
\quad & P
\end{align*}
\]

Fig. 3

Fig. 1 illustrates a position where the level of capacity of the person is above that of the work in his role and the varying pay which he may be receiving, i.e., \(P_1\) pay above the level of the capacity of the person; \(P_2\) pay equating with personal capacity; \(P_3\) pay equating with level of work; \(P_4\) pay below the level of work, and so on for the other diagrams.

I have found these diagrams to be of assistance to people in industry in accepting the proposition that there are three variables to be considered in an employment situation—the capacity of the individual, the level of work in the role which he occupies and the pay attached to that work. They help to reinforce the realism of the notion that people are paid for

the level of work they do. We do not pay people for what they are per se. If a person of high capacity chooses to do a low-level job we pay in accordance with the work he does, not in accordance with his personal potential.

At the time of the changeover of wage systems described earlier in this essay, there was no formalized segregation of different types of work into different categories. Work was referred to as unskilled, semi-skilled or skilled, and by a host of part descriptions of jobs giving literally hundreds of unformulated categories. Operators were posted to particular jobs but there was no explicit attempt to put men on work which appeared to relate to their level of ability, for the notion of level of capacity in the individual had not emerged and was substituted by watching physiological performance. Nor had the notion of the level of responsibility of work emerged further than placing reliance on a ratefixer to assess the relationship between the work he was studying and the person doing it.

During the negotiations which led to the change of pay systems which I have described, the problem arose of providing advancing rates of pay to match advancing individual capacity by attaching different brackets of pay to different levels of work. We undertook to examine the whole question as soon as possible.

In each of our Factories, a team composed of the General Manager, Chief Production Engineer and the Production Unit Managers, studied the entire range of work done by operators, described and categorized it and attached different brackets of pay to each category of work. These proposals were discussed with each unit committee of representatives and the overall factory works committee. Finally, the entire schedule of job categories and attached brackets of pay were submitted to, and approved by, the respective factory councils. Factory standing orders were then issued setting out these wage brackets and made available for all to refer to at any time.

I must emphasize that this operation was carried through on the basis of judgment, there being no attempt to suggest that objective measurement was being employed. The description given to the various categories of work could not be tightly defined and the attachment of specific wage brackets to different categories was on a basis of experience of the past, and judgment. Thus, even to-day, it is clear that if we take any of the descriptions of job categories, e.g., Thick Wall Unit Operator (a) 'able to set and operate a wide variety of machine tools or do difficult specialized work, full knowledge of Glacier techniques' it is not possible to derive from this description what work falls within or without its ambit. Thus, it is a matter of managerial judgment. In spite, however, of our inability to define categories of work tightly the issue of these standing orders did yield the following advantages:

(a) Because it was now clear that the categorization of work and the attachment of pay brackets was a matter of managerial judgment, the responsibility for such judgment could be allocated to specific roles. This does not imply that representatives of those concerned with the brackets were always ready to accept specific managerial judgments on the matter; but it did mean that negotiations were a challenge to managers' judgments and that the arguments were not rendered unreal by dispute as to whether the 'measurements' were correct, the fatigue allowance accurate, and so on.

(b) Every manager, supervisor and operator could see the full array of work being done in the various departments and, by asking questions, could ascertain which category in the standing order referred to specific types of work in which they were interested. They could then ascertain the bracket of pay for the job.

(c) An operator could thus get a reasonable idea of the kind of work he would have to be able to do and the sort of job he must seek in order to advance his level and his pay.

(d) The differential pay position of each described category of work, one to another in the factory, became stabilized and clear.

(e) Suggestions by a particular section for increase of the
bracket of pay attached to their particular work, could then be seen as a claim that, relative to other work in the factory, their work was underpaid. This could be seen not only by the operators making the claim but also by all others.

In this frame of reference, claims from one section must be discussed by representatives of all sections for, unless such discussion takes place, the granting of a claim by one section inevitably stimulates all other sections to make a similar claim. Whereas, if all other sections agree that the claim is just, then they are indeed saying: ‘Yes, relative to the rest of us this section, which is claiming more, is underpaid.’ We have, on the whole, found these bracket adjustment discussions between factory general managers and factory works committees, to be realistic and responsible. They are the institution through which brackets of pay are kept dynamically adjusted to our intuitive sense of the alterations which are taking place continuously in the level of work done by various groups of operators and individuals.¹

Thus, the second implication of abolition of wage incentive schemes is the setting up of a series of institutions through which responsibility can be placed for mediating wages brackets and their relation to different categories of work.²

¹ See Appendix 1 for a description of the mechanism employed in our Company for adjusting wage and salary brackets. It should be added for accuracy that the agreements arrived at between works committee and general managers are subject to ratification by the factory works council. For a description of the function of Glacier Works Council, see Exploration in Management, Chapter XVII.

² I wish to emphasize that the descriptions of work in the Wage Bracket standing order referred to are not operational definitions. Elliott Jaques’ work on measurement of responsibility provides us with the instrument whereby level of work may be measured. One day, when this is more fully accepted by managers and operators as being valid, we shall be able to employ it to categorize work in its different levels. We shall then have an operational definition of all types of work. In the meantime, it is very important to recognize that using these descriptive categories of work leaves room at all times for argument as to what lies within or without each category.

3. Quarterly Wage Reviews

The third and last organizational change implied by the change in wages system, is concerned with methods of assessing the change in work capacity of individual operators.

During negotiations about changeover to an hourly rate wages system, management had committed themselves to the responsibility of setting some formal institutions for the regular assessment of each operator. This is clearly a concomitant of such a change for, with a time allowance system, there is at least the implication that the growing or lessening work capacity of the individual will automatically result in an increase or reduction in pay.¹ There gradually emerged in each production unit an institution known as the Quarterly Wage Review. Section managers, assisted by their supervisors, consider each operation on the section in turn. Their terms of reference are to consider:

(a) Whether or not the operator is in a job involving responsibility consistent with his personal capacity and, if necessary, to change his job or to recommend to the unit manager promotion to a higher level of work elsewhere.

(b) If the operator is in the correct job, the relationship of his total performance and behaviour to the position of his hourly rate relative to the top and bottom of the bracket of pay for the category of work he is performing.

(c) Whether performance is such as to cast doubt on retention by the operator of the job he is doing, and a consideration of other jobs at a lower level which he might more successfully perform or reference of the case to a personnel officer to discover vacancies elsewhere in the factory.

(d) Whether or not the level of responsibility of the work

¹ This, of course, can happen only when the time allowances are a reasonably accurate reflection of the level of work to which they are attached and I have already, in this book, indicated my reasons for doubting whether this condition is ever present.
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being given to an operator to perform is, in the judgment of the manager, changing. If it seems to be going up, then it has to be recognized that the operator is possibly being promoted without specific recategorization of his work and appropriate action either to increase his rate or recategorize his work, must be taken.

(e) Such matters as future potentiality of the operator, vacancies coming up in the future which he might be able to fill, training, needed, etc.

These, then, are the three more important organizational implications of giving up wage incentive schemes:

(a) Fuller institution of real managerial roles on the shop floor.
(b) Categorization of all types of work in the factory and the attachment to each category of explicitly stated and published wage brackets and,
(c) The working out of a formalized process of quarterly reviews of the work and personal capacity of each operator by his manager.

It may be of interest to contrast briefly the theme of this chapter with what happens when wage incentive systems are at first introduced. Unfortunately I have no direct experience of taking part in the installation of a wage incentive scheme but many of my readers will be familiar with the changes which follow such an innovation. If my general thesis is correct, I would expect initially, the following tendencies:

(a) Some de-personalization of the relationship between, say, foremen and operators.
(b) A feeling of loss of control of subordinates by the foreman, arising from the fact that instead of having continually to assess the work and performance of their own team of operators as individuals in order to know when to advance their hourly rates in a judicious manner, they found themselves with restricted terms of reference in this respect.

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(c) At first, there would be general satisfaction in the department. The first result of all the work study leading up to the installation of the bonus system would be an increase of output and an increase of pay. Gradually, however, as changes of method had to be instituted, anxiety about the effect of these changes on weekly earnings would begin to cause dissatisfaction and relationships would deteriorate.

(d) Foremen would gradually find themselves spending more and more time discussing wage problems, time allowances and the like, and would have less time to spend on work organization, new methods, technical trouble-shooting, etc.

(e) There would be a feeling, on the part of foremen and other managers in the shop, that they were not as much in control of production as heretofore. Ratexiers, time study men and other specialists from 'upstairs' or from 'headquarters' would be appearing more frequently in the shop.

I invite my readers to check their own experience in this respect.
Time Clocks Abandoned

The subject of this chapter may, at first sight, seem to have little to do with the main theme of my book. I have included it, however, because time clocks are being used in industry as a ‘non-managerial’ way of trying to maintain discipline vis-à-vis punctuality in the same way that W.I. systems are used to control work. Both practices spring from the same attitude on the part of managers to their administrative tasks. The elimination of W.I. systems and of time clocks both required the same re-orientation of managerial attitudes and, in each case, the initial forebodings of both managers and operators have not been justified. Thus, the results of two experiments, both concerned with the elimination of practices which are conventionally assumed to be essential, tend to support each other.

The Experiment

In 1948 in our London Factory, over a period of twelve weeks, we maintained very careful records of the incidence of lateness in arriving for work on the part of all hourly paid operators in order to gain an overall picture of the true extent of this practice. The data were collected daily and merely indicated the number of people between one minute and five minutes late, between six minutes and ten minutes late, between ten minutes and twenty minutes late, and the number more than twenty minutes late. During this period our customary practices continued; they were that all hourly paid operators ‘clocked-in’ on arrival. If they were more than three minutes late, they lost fifteen minutes’ pay and pro rata with greater degrees of lateness. On a specific Monday in June 1948, operators ceased to ‘clock-in’. So long as they had made a reasonable effort to get to work they were paid as though they had started work at 7.30 a.m., the time of commencement of the morning shift. In as far as they were paid by a wage incentive system their wages would, of course, be affected by lateness, but there were many hourly paid people who were not paid by such methods. A man would not, of course, escape censure from his manager if he were late and, indeed, prolonged failure in the face of warnings could lead to dismissal.

For a period of twenty-four weeks following this change the ‘lateness recording system’ already described, was continued. The extent of lateness after the change was slightly lower than before but the difference was not statistically significant.

On the basis of this experiment, the following practices were initiated:
(a) All clocking-in and out at the start and finish of the normal working day was abolished throughout the Company. Clocks were maintained in operation solely for the purpose of clocking-out at the end of periods of overtime for, without these clockings, it would not have been possible to calculate overtime wages.
(b) In every department a board was set up with a small hook for every clock number used in the department. Each operator retained his old clock number, which was stamped on the face of a small metal disc which was hung on the hook bearing the appropriate number. On arrival, each operator removed his tally from his hook and dropped it into a box. This arrangement proved necessary in order that the departmental clerk could, later in the morning, quickly determine which operators had or had not arrived for work. In the case
of those who had not arrived, he instituted enquiries with their section managers to establish whether they were sick or merely absent. If they were sick it was necessary to set in motion the provisions of the Company’s Sick Pay Scheme and to inform the Wages Office of all absences for the half-shift or more.

Apart from minor changes in administrative detail, these methods have continued in operation in the whole Company. The methods outlined are used in our Factories in Glasgow, Kilmarnock, Manchester and London. It can fairly be suggested, therefore, that they cover a representative sample of the country’s working population. I know of no systematic figures on lateness produced by industry, so that comparison of the present position in our Company without the use of clocks, with others who continue to use them, cannot be made. However, lateness is not felt to be a problem in our company by managers and, in the fourteen years since we stopped clocking-in, I have never heard the suggestion that we should reintroduce the practice.

It was left to the section managers (roughly equivalent to foremen) to decide whether a man who had arrived after the start of the shift was late (in which case he was paid his full wage), or absent without leave (in which case he lost wages unless the reason given for absence was acceptable to the section manager). If the absence extended beyond the half shift, only the unit manager (in charge of the section managers) could grant pay for the time lost.

Before I started to write this chapter, I felt that it would be useful to get some first-hand information about current practice with regard to lateness, etc., and measures for controlling it. I, therefore, spent some time in the production departments of one of our Factories and discussed the subject with a general manager, two of his production unit managers and six section managers (roughly equivalent to foremen in other companies). None of these managers had any desire to reintroduce clocking. Here is an attempt to reconstruct and put on paper some of the comments made.

Section Manager A. ‘I became a section manager after clocking-in was abolished. Some time prior to that I had been a shop steward. If we were over three minutes late, we lost fifteen minutes’ pay. When we arrived, say, five minutes late, we would not start work until the fifteen minutes had elapsed, on the grounds that we were not paid for it. It was a very uncomfortable situation—hanging around. It was even more uncomfortable for the managers who never said much, but who looked put out. To-day, as a section manager, I would not tolerate a ridiculous situation like that—with men ready for work but unable to start because of some wages office regulation. It would lower my authority as a manager and everybody would feel ridiculous.’

Section Manager B. ‘I could not manage my section if, when one member of it was late, somebody in the wages office docked their pay. You could not be a manager if that happened. Perhaps he has good reason for being late and if so, it is up to me to say that it is all right. Perhaps, however, he is one of the lads who play that game too often, in which case, what is the use of docking him fifteen minutes—he probably made ten quid on the dogs the night before and feels he can afford to be late all the week. If they are like that you have to pull them into the office and really talk to them.’

Section Manager C. ‘Lateness is not a big problem—getting them to start work promptly, even when they are on time, is sometimes difficult. You have to keep an eye on things at 7.30. People want to chat. If you show you mean it, most people respond, but occasionally I have to get tough mostly with the younger ones. They do not realize the effect on production of these slow starts at the beginning of the shift.’

Section Manager D. ‘One of my chaps was always on time in the morning but every night he had his coat on five minutes before the shift stopped work. I got really angry with him because the stupid thing was that, although he stopped work before the end of the shift, he was usually still in the shop ten minutes after the end of the shift. I made him see sense in the end, but that is just an example of the fact that everybody is different. Standard rules like clocking-in and losing pay, do not fit lots of situations. It is just as bad to lose time at the end
of a shift as at the beginning. My job is to keep a grip of what is going on in the shop all the time. I do not need clocks to help me. If I did, I would not be much good as a manager.'

Most of those I saw made reference to the problem of 'what is lateness?'.

Section Manager E. 'If a man is three-quarters of an hour late, then he is late, but suppose he comes in an hour late then, in my view, he is absent without permission. If he is late and his reason is poor, I choke him off. If he is absent without permission, he has generally got a reason. Then it all depends on the person with whom you are dealing. Some you believe and accept their reason and they lose no pay, but others try it on too often, and then I let the absence chit go through and they lose pay. It all depends on the circumstances and the man with whom you are dealing. If a man is absent for more than a couple of hours, even although he has got a good reason and he is reliable, I see the unit manager and get his agreement before allowing him to be paid. You have to know your men or you are in trouble. Most of them are very good, but you get the occasional crafty type.'

Unit Manager. 'I find it necessary to check up on lateness from time to time and get my section managers to tighten up. If I go on the warpath things improve and then slip back until I pep it up again. Lateness is about the same here without clocking-in as it was in the previous companies for which I worked, all of whom used clocks. Getting a good start at 7.30 and after lunch and continuing to work to the end of the shift, are really more important issues than all this worry about men being late.'

I asked this unit manager whether any men had lost their jobs in his unit as a result of lateness, and he said: 'Yes; I can recollect two cases in the last two or three years. They were warned repeatedly but it was not any good. One of them appealed but he lost his case.'

It will be clear from the above comment that discussion about the practice of clocking throws up the whole question of managerial control and I wish to discuss this in detail for, at the time of abolishing clocking, we were giving some serious attention to the subject of authority of those in command of the shop floor. I do not think we should have been able successfully to do without clocks had this not been so.

In the previous chapter I have discussed managerial authority and have defined the minimal authority of a managerial role. I have already pointed out that it is the absence of this minimal authority in the role of foreman which seems to make necessary the use of wage incentive systems. This is also one of the conditions which makes the use of time clocks necessary for the maintenance of punctuality. If a foreman is not in a position to choose, assess or discharge from his immediate command those who are continuously guilty of failure to comply with his instructions, then strong pressure is set up for the more senior managers of the company to resort to indirect methods of maintaining discipline, such as the penalty for unpunctuality represented by the automatic deduction of pay by the wages office.

This can be stated the other way round. It would seem that if a company desires to get rid of the practice of clocking, then it may well be necessary first so to arrange organization as to be sure that consistent lack of good timekeeping on the part of any individual will be noticed and assessed by a manager with the requisite authority to deal with it.

Lack of punctuality is, of course, one of the minor sins of people in industry. If, however, a company decides to deal with it by the establishment of full managerial roles at shop-floor level then that company will also find that such managers can deal effectively with the whole range of their work in a more effective manner than was possible before they possessed such minimal authority. And so by exploring the relatively simple matter of clocking we are again brought face to face with the whole problem of managerial control.

Let us now consider the subject of clocking-in, and the
practices associated with it, from the psychological angle of those subjected to the practice. We found that 20 per cent to 40 per cent of all lateness was caused by 3 per cent to 5 per cent of those who worked in the factory. These were the people who felt that it was worth while to enjoy the liberty of unpunctuality at the cost of minor deductions from wages. The balance of unpunctuality was made up of a range of variation in conditions, such as:
(a) Weather conditions—fog, ice, snow, storms.
(b) Transitional domestic conditions making it impossible for people to be punctual without letting the family down.
(c) Minor ill health.
(d) Surges of traffic congestion.
(e) Temporary difficulties arising from change of domicile.
(f) Temporary deficiencies in public transport due to change of schedules, strikes, mechanical failure, etc.

Some men, caught up in conditions beyond their control, which cause them unwillingly to be late, feel that a company which, in addition, levies a fine, is inhuman. If you have to take one of your children to hospital in the early hours of the morning and if, in spite of that misfortune, you try as a matter of pride to be in time for work, then what would be your state of mind if you are fined fifteen minutes pay because you are five minutes late? Contrast this with the position which arises after the abolition of clocking. You report your family misfortune to your manager and he congratulates you on being only five minutes late! We all have heard the oft-repeated case of the craftsman who has worked for the company for thirty years. He clocks in every morning but his daughter of eighteen, who joins the office staff, is trusted to be on time without such a disciplinary procedure. He is certainly entitled to ask why he is treated as a less responsible person than his daughter.

Surely we have reached a position in industry where it has become essential that minor deviation in the performance of a person is appropriately assessed against the reality of that individual’s total performance by that person’s manager? One must have managers who can discriminate between the occasional lapse on the part of really excellent people and the person who seems to be incapable of exercising self-discipline and is correspondingly in continuous breach of the rules.

My own discussions with many operators on this subject of clocking before the change, made it clear that most people had no feeling of guilt when they were late ‘because they had paid for it’. There was little realization that a whole production process was being held up. Foremen were hesitant about criticizing lateness in the face of the fact that the wages office exacted the penalty by reducing wages on the evidence of the clockcard. Many times I had heard the remark: ‘You cannot fines a man for being late and then have him on the carpet as well’.

Immediately prior to the step of abolishing clocking-in I, as was my custom at that time, visited the nightshift one evening. I talked to a machine operator and asked him how he felt about the change which was imminent, and which had been agreed by representatives with management. The following conversation took place:

Operator: ‘I hate clocking-in; it is undignified and childish and, in one sense, the practice should go; but lateness will go shooting up—you will have to reintroduce the clocks.’

Me: ‘What about you—will you be late more often?’

Operator: ‘No—I will not—I am sometimes late now. Things go wrong at home, we have had a late night or I miss the bus, and so on. But at present I am not too worried; I lose a little pay and the firm loses some of my time. But if I am to be paid in full even when I am late, I shall be worried. I am not taking charity—something for nothing. I do not think I like it but all the same, clocking-in is a bad thing. Why should we have to clock when the staff do not?’

Me: ‘Well, maybe the others feel the same as you do.’

Operator: ‘No, you are wrong there. You do not seem to know much about some of these people in this shop. A lot of them
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are very irresponsible. They will take full advantage of this. They will be late if it does not cost them anything, you will see.’

I became very interested and saw twenty-four operators in different departments that night. I had very similar conversations with each of them. Each referred in vague terms to the large irresponsible element amongst their fellow operators but expressed the intention of behaving responsibly themselves.

Attitude of Representatives

If the management of the Company had worked out the idea of abolishing clocks and then simply told all concerned that it was going to be introduced as from a particular date, I do not think it would have been a successful move. Changes which concern people, even when they are a move in a liberal direction, cannot be imposed or introduced without agreement of the representatives.

We had already come to agreement with our representatives that people who were persistently late should be properly and fairly warned. If lateness persisted then, subject to the right of appeal, they would be discharged from the job.

The italics are very important. Since 1941 we had used a formal Appeal System which gave all employees of the Company the right to appeal to ever higher managers if they felt that their manager’s decision was either inconsistent with Company policy or unfair to them personally. Such appeals take place, of course, in the presence of their own manager. I have described this appeal mechanism elsewhere and will not go into further detail. Suffice to say here that I refer to a precisely defined social mechanism agreed by representatives and managers and understood and trusted by the employees of the Company. It seems doubtful to me whether it is reasonable to establish full managerial roles with authority to select,


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assess and discharge without the safeguard of such an appeal mechanism. At least I can say that, with the existence of such an institution, shop stewards in our Company were ready to agree that if a man were consistently late or failed to observe agreed policy in other respects then he should, after official warning and subject to appeal, be discharged from his job.

Another point arises here. Over many years I have frequently heard debates about such questions as: ‘Should a foreman have the right to dismiss a subordinate?’ It seems to me that the argument really turned on the meaning of the word ‘dismiss’. Did those using it mean ‘dismiss from the company’ or ‘dismiss from the role with the possibility of employment in some other role in the company?’ When I use the word I intend the latter meaning. I see no proper argument for assuming that because a man is unsatisfactory to one manager that, therefore, it is to be assumed that he will be equally unsatisfactory to all other managers in the company. Sometimes one comes up against the argument that ‘if a man has been discharged from a job by one manager in a company, then it is an affront to that manager if the man whom he has found unsatisfactory is employed elsewhere in the company’. I see no logic in this attitude either. It is such ideas, coupled with the general absence of appeals mechanisms, which inhibit the setting up of full managerial roles on the shop floor and lead to the necessity of indirect disciplinary controls such as clocking.

It is these old-fashioned and, I think, illogical attitudes which cause many shop stewards to take up equally unreasonable attitudes about minor disciplinary breaches such as lateness. So long as people are subject to the impersonal, standardized and, often, quite unfair discipline of the clock then they will, with equal lack of logic, defend individuals whose conduct, on rational grounds, is indefensible. If, on the other hand, a reasonable total framework is established within which shop-floor managers are given the authority not only to discipline people but also to take into account all the very
real problems and happenings which on occasions make it difficult for people to conform to all the rules and regulations, then representatives too can also behave reasonably. They know, just as surely as managers, that regulations are necessary, that widespread lack of observance is highly detrimental to the economic future of the company and, in turn, to the interests of all its employees. If, however, they can feel that the total frame of reference is one which acknowledges the proper freedom and dignity of the individual, then they can co-operate with managers in attempting to secure the prosperity of the whole company.

Ostensibly this chapter has been concerned with the abolition of clocking. It can be seen, however, that this practice is, in reality, a manifestation of a much more important subject. Consideration of clocking has, I hope, demonstrated its connection with the way in which managerial authority is structured into organization and the manner in which this authority is used. Attention to the role of the foreman is overdue in British industry. Millions of people work under the command of such men. Their effectiveness, and the efficiency of British industry, is therefore partly dependent on the personality, training, authority and responsibility of those foremen. The study of clocking may not, in itself, be particularly important, but the principles which appear as a result of such an examination throw light on a much bigger and more crucial issue which merits the most serious possible consideration.

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Some Speculative Considerations on Wages Systems

In this essay I have presented a case against the acceptance of wage incentive and time clocking systems because, contrary to popular belief, I am convinced that instead of optimizing production and individual satisfaction in work, they are hindering both. I am not alone in this conviction. If the reader had the opportunity to meet operators, supervisors and managers in our Company, though all of them might not be able to present a logical case, nearly all would shun the idea of reintroducing a wage incentive system. I have met managers in a few other engineering factories who have given up the use of such systems. None to whom I have spoken would support their reintroduction. Such opinion is important because it comes from those who have had the experience of hourly rate systems, then the change to incentive systems and then on to hourly rate systems based on the experience gained in the operation of wage incentive systems. They will have been able to test the notion that people are predominantly motivated by personal gain and have found it wanting as the main explanation of individual conduct at work.

This, then, is one of the main conclusions of my own experience with wage systems; that each individual has his own

1 Those companies who are considering the introduction of wage incentive systems might well consult the experience of such companies as Vauxhall Motors, Lever Bros., F. Perkins of Peterborough and others, before deciding to go ahead.
norm of pace of work and application to work and that, given a reasonable physical environment, a level of work reasonably consistent with his capacity and a regular level of pay consistent with such work, he will produce, on average, that quantity of work which is his own optimum contribution. He can spurt for quite short periods in emergency but he cannot keep it up.

In short, given a congenial physical environment and a situation where the level of capacity of the individual, the level of work he is doing and the level of pay are in reasonable equilibrium, then those are the optimum conditions not only for maximum effort but also for individual satisfaction.

Now this is in contrast to the generally accepted view in Western society which seems to contain the following assumptions:

(a) That pace of work is not a function of the total psychological and physiological character of the individual but of the environment in which he finds himself or is placed and that, by adjusting the environment, e.g., by gearing pay to quantity of output, his enduring pace can be slowed or quickened.
(b) That personal short-term monetary gain is the predominating stimulus to application, inventiveness and enthusiasm in doing work.
(c) That competition for economic gain is a more powerful stimulus than competition to excel others in creativeness. Thus, the word competition carries, when used in connection with day-to-day work, the connotation of competition for material gain or competition to avoid economic loss. If a company’s goods are described as being ‘very competitive’ it usually means low priced and seldom is meant to infer they are better designed than those of other companies.
(d) That man is at his most creative when in the fight situation; that fear is a creative stimulant; that feelings of some economic insecurity are necessary for good work and, conversely, that if the necessities of life are guaranteed, then this will have a degenerating effect on the moral fibre of people.

Because of the foregoing, our industrial and social institutions tend to be structured in such a manner as to cause personal aggrandisement to be confused with social success. Thrusting personal ambition for one’s own material gain is still to-day a very valuable characteristic in the search for high status in society. As a result, Western democratic societies lack an ethic and a set of values which link our daily tasks with our social responsibilities. The ordinary person is thus inhibited from seeing his daily work as a contribution to the society of which he is part, as well as a means of building his own career and supporting his family. Respect for others, the urge to contribute to something bigger than oneself, even patriotism itself, thus finds no outlet. We find ourselves envying societies where individual people can regard themselves at their daily work as contributors to the welfare of the society of which they are members.

Now, many readers may feel—‘no, our society is not like that; it has rejected the ideas of Adam Smith and does not regard man as an economic animal’. I wish they were correct. We are in a state of transition but the process is too slow. I think we have reached the stage where the thoughts of many of us have developed beyond our actual behaviour. In other words, whilst we reject the doctrine of personal gain as a reasonable ethical basis for the conduct of society, yet we continue to behave, unwittingly, in accordance with such an idea. I invite my readers to consider the following examples of the way in which society behaves.

1 ‘All of this meant, and still means in the current thought of many, that man is an “economic man” carrying a few non-economic appendages... though I early found out how to behave effectively in organizations, not until I had much later relegated economic theory and economic interests to a secondary—though indispensable—place did I begin to understand organizations or human behaviour in them... The contrary view is almost always implicit and frequently explicit in the statements not only of business men but of labor men, politicians, statesmen, professional men, educators, and even of church ministers. As one result, effective leadership has to be based on intuitions that are correct, notwithstanding doctrines that deny their correctness.’ Chester Barnard, The Functions of the Executive, Harvard University Press.
(a) Political parties seem to be mesmerized by the notion that the only way to gain the support of the electorate is to appeal to the individual sense of personal gain. Attempts to tap other values are rare except in time of war, threat of calamity or periods of great hardship. My friend Dr James Hemming, in a recent article in *The New Era,* summed up the point I want to make so well that I shall quote him in full:

Starting at the top, the Government—and the Opposition too—are failing, and have failed for years to give young people any kind of vision to stir their imaginations and touch their altruistic yearnings. Young people need to feel that their country is decent in its mode of life and dedicated to objectives that are worth their while pursuing. What dream of the future is the British Government offering—the prospect of doubling our standard of living in twenty-five years so long as we are obedient now. This is a travesty of what a national purpose should be. There is nothing here to reach or stir youth. The appeal is self-centred and materialistic. No mention is made of Britain’s potential contribution to a struggling world. The emphasis is not on giving anything but on getting as much as possible for ourselves. The real challenge of our times is to face the population explosion and feed a starving world, to organize production for the common good, to defeat disease, to develop a world in which each nation, contributing from its resources of goods and skill, makes common cause with all nations in raising the level of human fulfilment throughout the world. All this is ignored. Where there is no vision the young people particularly perish. There is no vision to-day. Our political leaders even say we don’t want one, that all that really touches people is the ‘lolly’. This is as much an under-estimation of what we are as was Ribbentrop’s estimation of us in 1937. The tragedy is that to-day it is not an enemy but our leaders who belittle us.

(b) Many examples exist of companies which, in situations of vigorous competition have, by any criterion, done extremely well; but it is equally clear that some of the most competitive industries have very poor records in terms of inventiveness, service to the consumer, working conditions or capacity to earn foreign currency by exports. There are many large companies in Britain who, whilst competing vigorously with others at home and overseas have, nevertheless, reached a situation where they are rid of the fear of demise in the near future because their sheer size, scale of investment in plant, intensity of their product development, etc., has placed them in a position of relative security. I refer to companies such as I.C.I., Unilever, Dunlop, Joseph Lucas, Tube Investments, A.E.I. and others. Companies such as these, in general, serve society better than smaller companies, provide the best working conditions, produce the best designed goods, have the best export records and exhibit the most hopeful long-term potenti- alities. Despite this, their sheer size causes anxiety because it generates the notion that they no longer have to face the same intensity of competition. There is apparently, in both political parties and in society generally, a failure to recognize the essential conditions of creative industrial achievement. Such conditions involve a sufficient degree of security to allow a high rate of investment in product design, manufacturing technique, organizational research, training of staff, development of markets, etc. A business cannot saddle itself with the heavy expense of such essential creative activity (which does not earn ‘quick’ revenue) if, in the interim, some competitor, more interested in short-term profits, is prepared to squander not only its own future by failing to do these things, but that of the nation as well. Thus it is that short-sighted fly-by-night industrial policies based on the lure of quick profits can inhibit the creative industrial policies upon which the future prosperity of the whole economy rests.

I am not suggesting that the large concern is inevitably good and the small bad, for such a contention is demonstrably untrue. I am suggesting that there is far too little realization of the profound contribution which many of our best large
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concerns make to our welfare. There is far too little praise given to their achievements, too much anxiety about their sheer size. There is too much dependence on the idea that the more vigorous inter-company competition the more certain it is that the creative acts will be taken; too little realization that real achievement is compounded of high investment, long-term planning, good organization and devotion to excellence rather than immediate gain.

The nameless hundreds of small firms who experience the full impact of intensely anxiety-provoking day-to-day competition for the business without which they cannot continue operations, are those which often cannot undertake product development, cannot provide good working conditions, cannot successfully export. Sometimes they are not national assets but squanderers of those assets. And yet, these latter small firms are the prototypes of the ‘competitive ideal’. Why, instead of a Monopolies Commission, do we not have an Industrial Effectiveness Commission? Is it not that which we really need? Some means of making certain that no company is wasting national assets in any form and thus depriving the community? But no, the stereotype of ‘beneficial competition’, the Adam Smith hangover, the idea that the optimum plan is to have every company divorced from security and fighting for its own maximum gain, is part of our culture, and it still seems to prevail.

(c) A very large section of our society fears the Welfare State, not because they do not want people to live in decent conditions, but because of its ‘feather-bedding’ danger. One has heard people in all sections of society express anxiety that without the ‘healthy’ struggle for the amenities of life our people will lose economic virility. Many have come very near to saying security is bad, insecurity is good. Some economists and many Conservative politicians, have expressed alarm continuously about ‘only 1½ per cent unemployment’. What they are saying is: ‘Better the tinge of anxiety for every industrial worker,

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better sacrifice the few to unemployment than have to face other solutions to the problems of labour immobility and wage inflation.’ There is, however, little historical evidence to suggest that it was those from homes and families shrouded in fear of not being able to fulfil to-morrow’s wants who contributed best to science, art, organization, government or in other ways, to the good of the community. No medical authority to-day suggests that insecurity, anxiety or fear is good for the health or effectiveness of the individual.

(d) It is very essential in a modern state that the government exercises some control over the rate of private investment in capital projects. One of the main instruments used, perhaps the main instrument, is alteration of the bank rate. Let us consider for a moment the rationale of lowering the bank rate as a means of attempting to increase the rate of industrial investment. Business men are assumed to note that money is cheaper and then to decide that the time has come to expand capacity, replace old plant or increase stocks. But the determinants of such decisions by business men are not the cost of money. If markets want more goods, business will borrow money and invest to expand capacity, whatever the bank rate is, within its normal cycle of movement. The interest rates which the German business men have had to pay for the last few years have been exceedingly high (8 per cent to 12 per cent) but this has not curbed their appetite.

If business is bad, demand low and profits poor, there is no interest rate which will stimulate the normal business man to invest. Why do the old shibboleth persist? Why does not the Government simply ask a sample of company directors what the effect of varying the bank rate on their investment policy really is?

I wonder what would happen if a Conservative prime minister met the heads of the fifty largest companies in this country and said: ‘Your investment policies exercise a substantial effect on the economy of the country. You are not at
Present expanding capacity, improving plant, etc., because current demand does not in itself justify such action. You know, however, that it is a statistical certainty that within the next \( x \) years you will again invest heavily. I ask you to take the risk of starting up your expansion and renewal policy now because it will not only help your country but will also bring nearer the day when demand will start to rise again. Come back in a month and tell me what you are prepared to do.'

I believe the response might well be extremely good. Such an approach is not made because, I think, of an underlying assumption which might be stated as follows: 'Business men will not invest because it might help their country—they will do so only if money is made cheap or demand rises, so that it will pay them to do so. The only way to curb their investment is to increase the price of money or cut their market by a sudden increase of purchase tax, etc.' This, basically, is the old assumption about economic man.

(e) In the vigorous psychological climate which followed the end of the last war, the country faced up to the fact that ill health must receive skilled attention regardless of the patient's ability to pay—the medical profession must be a profession and not a service giving business. There was, however, much foreboding by all strata of society on the dangers of exploitation of the position by the many. At first, after the National Health Service became established, one could hear on all sides the tales of patients who 'blackmailed' doctors to provide supplies outside the terms of the Health Service, or lose them as patients. It was almost as though many in the country wanted the idea to fail. Wiser counsels pointed out that a minority was bound to exploit the Health Service initially but that such malpractice would diminish as a sense of responsibility asserted itself. And so it has been. The National Health Service works and provides a lead to the world. But, to the extent that doctors and specialists are still 'business men' having to look for patients to protect their standard of living, it is jeopardized.

Some Speculative Considerations on Wages Systems

There is ambivalence here. Two views of society oppose each other. One says: 'Provide the service free and trust the people'; the other says: 'Do not trust them—make them pay for dentures, glasses, prescriptions, and so on'. One view says that the provisions of free treatment to all foreign visitors is a magnificent gesture which has done the country's status much good; the other objects to British people paying the cost of foreigners' ill health. Which view will prevail? The acceptance of man as an economic animal who will cheat if given the chance, or is he a species with untapped capacity for co-operative endeavour?

(f) There must be well over one thousand men engaged in the profession of business consultancy to-day. A substantial proportion of their time is spent, particularly with new clients, in studying work on factory floors. There are many companies where their experience at once convinces them that output could be raised 20, 30 even 40 per cent, if the company will make changes in production technique, arrangement and flow of work, assembly conditions, methods of issuing materials, etc. Based on such new arrangements co-ordinated targets are worked out for individuals which, experience indicates, can be achieved without undue physical exertion. Now why is it then in almost all cases, the next step is to propose a wage incentive plan? Cannot we have more experiments instead of this convention? Would it be too daring, for a change, to seek the collaboration of workers and their representatives not, as usual, around a wage incentive scheme, but around a proposition to raise hourly rates or weekly wages by the same sort of percentage that would have been earned with the wage incentive scheme and launch the total operation on a basis of mutual confidence? Must we always have the economic bargain of a wage incentive scheme with the mistrust which it connotes? Must we go on believing, the at least partially worn out assumption that this is the only way to make the new production plan work?
(g) Why do we pay operators and craftsmen in industry on an hourly basis, and junior clerical staff on a weekly basis? Is not the underlying reason that operators cannot be trusted to turn up to work regularly and so they are to be stimulated by the thought—any absence, less pay? The argument is clearly extremely thin to-day when those who work in offices and workshops are increasingly drawn from the same social strata.

I know from experience that to change the pay arrangements of operators to a weekly basis is very difficult because of tradition, trade union regulations, and a host of other complications but it is noticeable that the subject seldom comes up for discussion. One occasionally comes across quite harrowing situations where father, who has worked with the company for thirty years and is a trusted and skilled craftsman, finds himself at a disadvantage with his daughter or son who, on joining the 'staff' of the company at the age of twenty, is paid for absence whilst he is not, does not have to clock-in to work daily, whereas he does. Again, the distrustful bargain based on some deep underlying theme which no longer holds true, if it ever did.

These are but a few examples of the behaviour which cause me to feel that our customs and our culture contain a whole set of implicit notions which are seldom put to the test because they are seldom voiced. It is always the unacknowledged assumptions which die hardest because they cannot be questioned in a frontal manner. Nobody admits that he personally is an 'economic man'. Ask your colleagues, your subordinates or even your manager, if he would work harder if paid on a wage incentive basis or if the security of his job were threatened. Ask him if there was any thought of personal gain in his mind as he burned the midnight oil on his latest inspiration. You know the answers you will get because you know the answers you would yourself give to such questions. But start a general discussion about man in general; about all those whom you have never met personally, and out will pop all the old mis-

trustful shibboleths about material man and his lack of response to any inspiration except economic ones. The impetus towards wage incentive schemes is built on these generalized implicit assumptions. They are no longer generally true. They may have been necessary in the past to minds unused to co-operative endeavours; such wages systems to-day increasingly stultify progress.

When our Company started to move away from wage incentive schemes, the large majority of those people whom I met in other companies shook their heads and said: 'From an idealistic point of view, this idea is good but you will be in trouble; you will lose output and you cannot expect your customers to pay for your idealism.' 'Men work for money and work harder for more money' said one of my friends. 'Your workers will respond at first to the sheer idealism of the idea but, as newcomers join your Company, you will have to revert to payment by results' said another. Well, those forebodings were not borne out. We are by no means the only company who has had this experience but, as I have said earlier, few others commit to paper the results of their experience.

Here, in this essay, is the history of a series of changes and the behaviour which followed them which gives the lie to those cynics who think that all men respond best to the carrot dangling in front of their noses. This is not however, the story of 'idealism' triumphing, for the changes were not framed in such a mood. My plea is that we should reject cynicism about people as the basis of organization but, equally, we must reject idealism. In fact, we must reject generalizations that are not well founded on objective observation. If we look back at history we must be forced to accept that growth in civilization has been growth in the capacity of the individual to co-operate with others in society in pursuit of objectives of common interest. Our great national institutions are all founded on assumptions about the potential sense of responsibility of the individual towards others. We are at fault in industry
because we so often build our social institutions on the opposite assumption. Too many of us are cynics about the characteristics of other people; there is too much selection of evidence to support pessimism and too little capacity to take into account evidence which would counter this pessimism.

One salient point must be remembered. If we construct our social institutions to match the assumption that people are incapable of responsible behaviour, then we shall get irresponsibility. It is ridiculous then to cite such irresponsible behaviour as evidence in support of our own cynicism.

Behaviour is far more a function of environment than most people realize. We are too prone to assume that all behaviour stems from character and there is insufficient appreciation that whatever the character of the individual may be, his behaviour will be strongly biased by the situation in which he finds himself. Thus, wage incentive systems, in my experience, stimulate envy and greed, whereas equilibrium between personal capacity, level of work, and pay, stimulates co-operative behaviour.

If we can bring ourselves to look at our conventions and our customs, we will discover in them the source of much of the behaviour which causes such forebodings about our own species. They are full of misleading assumptions and illusions. Science can and will eventually destroy these illusions and by so doing will open the way to more viable modes of conduct and human happiness. In other words, we will conquer our anxiety about ourselves when we can face the need to use science to study our relation with our environment and to discover more about the real nature of the social institutions which are part of the fabric of our daily lives. Hope lies in the pursuit of more knowledge of such matters. Illusions about the reality of our environment are always harmful; science can destroy them by substituting more accurate perception. On the basis of such greater acquaintanceship with reality we can advance to more satisfying living conditions.

Appendix

This appendix is concerned with an analysis of the theory underlying negotiations between representatives and managers about 'differential entitlements'.

Differential Entitlements are defined as changes in pay, brackets of pay, holidays, hours of work, conditions of overtime, night-shift working, physical conditions of work, etc. In fact, all circumstances that can be considered working conditions in the broadest sense of the term.

Any change in entitlement for one group of employees of a company creates a situation where, relative to all other groups, the former have changed their position. Thus, it is not only the group who are subject to the change who must sanction such change but the whole body of persons in the geographical area who sense the differential alteration in working conditions brought about by the change.

For example, if the management of a business agrees that the bracket of pay attached to Type A work shall be raised, then what they have done in collaboration with the representatives of section A is to agree to increase the pay of section A relative to all other employees in that factory. The others, whose pay has not been changed, have dropped relatively to section A and this is the way that many of them will feel.

If the increase awarded to section A is significant to the others, they will quite possibly attempt to restore the status quo by seeking an upward adjustment of pay for themselves. Now if, in agreeing the increase to section A, the managers involved have felt that section A’s work ought to be paid for
at a higher rate relative to other work, then their response to demands for adjustments from other sections will be to regard them as unreasonable. They will think or perhaps say: 'We felt that relative to other work, section A work was underpaid. We, therefore, agreed to increases. If we now agree that other sections should be paid more merely because pay for section A work has been increased, then this is self-defeating because the differential position of section A would be unchanged.'

I am sure my industrial readers will agree that I am talking about a very real difficulty which exists. It can be put in another way, as follows: 'Be very careful indeed about adjusting the pay for any particular work in a factory because, before you know where you are, all sections will claim similar treatment; if you think particular work is underpaid do not let the logic of your thoughts run away with you because, although you may seek to redress the unbalance by agreeing an increase of pay, the other section will soon unbalance the situation again by insisting on similar treatment.'

The fact is that there is a missing institution in these internal negotiating procedures.

If the manager who wishes, or agrees under pressure from representatives, to increase section A would discuss his proposal with representatives of all sections and get their agreement to an alteration of differential entitlement to section A before implementing his decision, then he will avoid the problem.

This is the procedure which we found to be necessary at Glacier. Representatives approach the appropriate manager for a change in the bracket of pay attached to a particular type of work. Discussions take place but both parties know in advance that a change will not be made unless representatives of all other sections agree that this differential adjustment to section A's work is appropriate. Representatives of section A take their proposal, whether or not it is agreed by management, to a joint shop stewards' works committee. The committee may agree to support the claim, they might turn it down or reduce it, or they may agree that it is sound but that two other sections should be similarly treated.

Management have agreed in advance that any claim for differential alteration affecting a limited number of types of work which is supported by representatives of other sections (which will suffer a differential fall in pay if the claim is accepted) has a high chance of being accepted by management. The logic of this managerial attitude is as follows: if the claim is felt to be absurd by the works committee, they will either turn it down or they will say: 'Well, if this section is to go up, most others should go up also and we will claim accordingly', and the latter is precisely the sort of claim which they know in advance will be rejected by management. Whereas if the claim for section A's work is felt by the committee to be reasonable they will back it, as it is made, perhaps with trifling consequential adjustments to other sections whose work is perhaps similar in some respects to that of section A.

As a result of the operation of this procedure, there has been, over the years, a constant flow of small adjustments to wage brackets for different types of work which have been negotiated without trouble and with goodwill on both sides.

My reader may perhaps say to himself: 'This is starry eyed because all that will happen is that the works committee will size up the situation and agree every demand from each section as it arises, reassuring those made anxious by their differential loss of pay that this will be short-lived, for their turn will come soon'. This could, of course, happen but my experience is that it does not.

What perhaps is overlooked is the twofold feeling about pay negotiations. There is the general desire for wages to increase but there is also the genuine anxiety about change in differentials and this, I think, tends to prevent agreement by some of a change in differential wages for others unless there is some degree of rational agreement that this change is justified on the basis of work done.

Industrial people, whatever their position, become very
Piecework Abandoned

experienced in the reality of the setting within which they work. They know the trouble that arises from the unreal principle 'if anybody's wages rise, we ought to rise' for within each of them is contained the experience that the level of work in different positions does change and that the level of capacity of people also changes. It is not going too far to suggest that there is a real felt need for institutions which allow a flow of minor changes in the pay attached to different levels of work to go on all the time and that present wage negotiation methods, with their rigid adherence to dealing with great blocks of occupations as though the work in them was static, are known to be unreal but the emergence of institutions which allow these continuous dynamic adjustments, is clearly felt to be something realistic. These, I think, are the reasons why the kind of mechanism for adjusting wage brackets described above, have been accepted and used with responsibility rather than treated with irresponsibility.

There is undoubtedly feeling when the representatives of, say, all operators and staff, agree to a change in a wage bracket for a small section of jobs. I think, however, that those who agree these differential changes, have a minority feeling inside themselves that if they cannot sanction such changes then later, when there is a logical case for the section they represent to be treated in a similar manner, others will not be able to sanction that change either. There is undoubtedly a feeling of quid pro quo generated, but it is not an irresponsible bargaining but an acceptance of the idea that such changes are rational and, indeed, necessary.

There has been objection at times of a very strong sort from militant union members, that to have, in a council setting, a situation where changes which have been discussed as between their representatives and managers, must be sanctioned by those representing weekly or monthly paid staff, is against all tradition. There have been equally strong feelings on the part of staff that for changes in their salary brackets to have to be sanctioned in a council setting, by representatives of hourly

Appendix

paid workers is infra dig. or 'inappropriate'. These problems of feeling have, however, been worked through in the light of the analysis presented in this appendix and in the recognition of the underlying fact that any change in wage levels to any small group of those employed in one geographical entity of a firm is, in fact, a change to all in a differential sense. It can be said that common sense has triumphed.

Finally, I have talked about feelings of differential change in wages of groups being confined to geographical areas. If, in fact, the change is big enough, of course the feelings will affect the units of a company which are geographically separated, but these are the bigger changes and have to be negotiated in a similar manner. When it comes to changes of a national sort, this analysis is equally true, as can be seen by the fact that a change in one industry immediately starts generating a desire for change in wages in all industries.
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