

PRODUCTIVITY

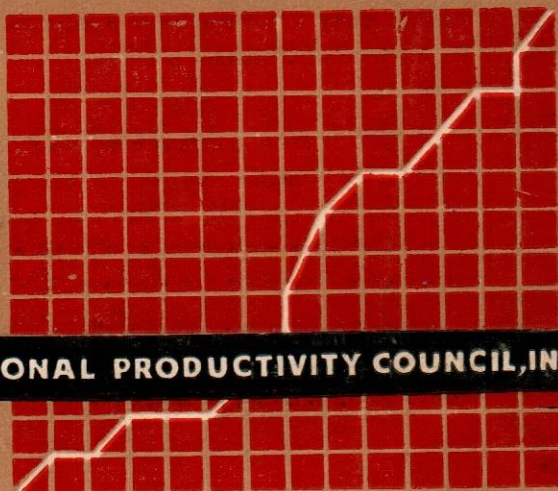
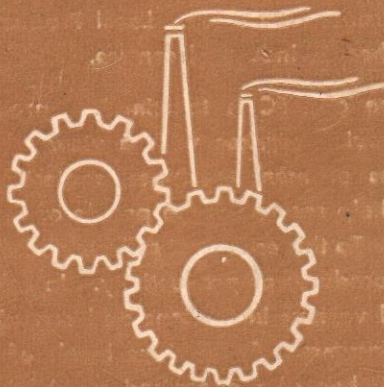
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NATIONAL PRODUCTIVITY COUNCIL, INDIA

NATIONAL PRODUCTIVITY COUNCIL

The National Productivity Council is an autonomous organisation registered as a Society. Representatives of Government, employers, workers and various other interests participate in its working. Established in 1958, the Council conducts its activities in collaboration with institutions and organisations interested in the Productivity drive. Local Productivity Councils have been and are being established in industrial centres.

The purpose of NPC is to stimulate productivity consciousness in the country and to provide services with a view to maximising the utilisation of available resources of men, machines, materials and power; to wage war against waste; to help secure for the people of the country a better and higher standard of living. To this end, NPC collects and disseminates information about techniques and procedures of productivity. In collaboration with Local Productivity Councils and various institutions and organisations it organises and conducts training programmes for various levels of management in the subjects of productivity. It has also organised an Advisory Service for industries to facilitate the introduction of productivity techniques.

NPC publications include pamphlets, leaflets and Reports of Productivity Teams. NPC utilises audio-visual media of films, radio and exhibitions for propagating the concept and techniques of productivity. Through these media NPC seeks to carry the message of productivity and to create the appropriate climate for increasing national productivity. This Journal is an effort in the same direction.

The Journal bears a nominal price of Rs. 1.50 per issue and is available at all NPC offices. Annual subscription (Rs. 9.00 to be sent by cheque in favour of National Productivity Council, New Delhi) is inclusive of postage!

Opinions expressed in signed articles are those of the authors and do not necessarily reflect the views of NPC.

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We have to prepare ground for our next 'jump', and not the next step...The devil is at our heels...I should like you to have this kind of feeling...I want work and work and work. I want achievement... I want you to do big things. I want you to build up India. That is the spirit in which you have to undertake this job...Let us go swiftly and definitely in the direction of a socialistic economy...

...apart from the practical results which we have achieved, and these are considerable, there is something even more important, even though it cannot be measured and weighed. This imponderable factor is the spirit of the people, the removal of inertia in thought and action, the development of a team spirit in national work and the sense of partnership in great undertakings...

All the factories that are coming up in India are interesting in themselves, but to me they are rather symbols of something bigger that is taking place...Some of us in our own way are also engineers, human engineers, trying our utmost to weld and integrate. There are so many odd pieces in this country which require welding together....

...there are still people...who talk about laissez faire economy. For me that is a bullock cart variety of economic thought, which has no relation with the present...I call that a bullock cart way of thinking to talk about pre-ordained, pre-destined, petrifying economic phenomena. Surely, economic science and industrial science have advanced since those ideas filled the minds of people....

...we must realise that this is an age of dynamic change, and we have passed the stage when a few persons, whether they call themselves government or captains of industry, could control the many-faceted life of a country and lay down the decree. One has to find an equilibrium among the various forces at work. In finding this equilibrium in a democratic country one has to take the vast masses of the people into confidence. One has to produce a sensation in them that they are partners in the vast undertaking of running a nation, partners in government, partners in industry....

JAWAHARLAL NEHRU

Sharing The Gains of Productivity

THE attitude of NPC to Sharing the Gains of Productivity is one of active neutrality. By its constitution and functioning, NPC is bound to be neutral as between the various factors of production that participate in the industrial process. But since the non-settlement of issues involved in sharing the gains of productivity is itself a hurdle to the progress of the productivity movement, NPC is actively interested in seeing that it is settled on an incentive basis: that is to say, the gains of productivity should be so shared that the decision-making authorities should be motivated to make such decisions as are conducive to higher productivity, and that the working class should be simultaneously and strongly motivated to participate in such decision-making processes, as also in the carrying out of such decisions. It is in this sense that the NPC is anxious to force the issue, simultaneously affirming its positive neutrality in regard to the distributive process.

In order, however, that the paramount objective of maximum productivity may be achieved rapidly, the President of NPC, in an article printed in the last issue of this Journal, stated the position with regard to the problem as follows: "...on one thing I should be unequivocally clear both as the Minister of Industry of the Central Government and the President of NPC that the first and prior claim on increased productivity, must be higher remuneration for labour. We must write this in our industrial code and make it clear both by words and deeds that the gains of higher productivity must primarily be devoted to raising the remuneration of labour to fair wage level. The consumer by way of reduction in prices or holding on to a reasonable price line must be close second in sharing the gains of productivity. The industry will undoubtedly reap the benefit of both these gains and much more, the consequential benefits of development and production ..."

The policy of the NPC, with regard to the broad issues involved had also been stated by Dr. PS Lokanathan in an article on the Fundamentals of Productivity which appeared in the February-March issue of this Journal. The principles stated by him may be read together in the context: "No social system can work without the willing cooperation of the working class . . . A more productive reorientation of the economy requires a positive and of course an egalitarian philosophy . . . We shall succeed in our productivity drive only to the extent that we make life tolerable, if not, comfortable for the small man..." In this connection Dr. Lokanathan quoted the Directive Principles of the Constitution which have a bearing on sharing the Gains of Productivity: "That the citizens . . . have the right to an adequate means of livelihood . . . That the

operation of the economic system does not result in the concentration of wealth. The State shall make provision for securing just and humane conditions of work . . . a living wage, a decent standard of life and full enjoyment of leisure and social and cultural opportunities. . . .” Apart from the Constitution, the Sovereign Parliament having resolved that India shall be a Socialist State should satisfy the working class with regard to the basic attitude of Government to the distributive process as a whole.

These big political and economic issues will, of course, be solved over a period by the free working of democratic forces. NPC being primarily interested in the productivity drive would like to focus attention on such increases in productivity that can be rapidly achieved and would, therefore, like that some workable schemes at the plant level be devised as to the sharing of incremental or marginal productivity, so that the application of productivity techniques should not for want of such settlement be held up.

It would, therefore, be desirable that the subject of productivity in a whole industry or economy be kept out of debate, for decision on such big issues—which will in any case take time—might not come in the way of many small gains that can otherwise be secured at the plant level. NPC would like to contribute to the clarification of such matters as stand in the way of taking productivity decisions at the plant level. In the first instance, we need to avoid confusion as between an increase in output and an increase in productivity. While labour is entitled to negotiate for its share in increased receipts on any account, it is essential for the purpose in view not to mix up issues. It is only an increase in productivity that has to be and must be shared, while an increase in output brought about by methods other than through the employment of productivity techniques is a different matter to be settled in its own way.

The argument is equally applicable to large receipts arising out of higher prices for the products sold by a firm. It is essential to keep the working of market forces outside the purview of this debate; but once again, capital and labour are entitled to negotiate with each other, if the working of market forces becomes favourable or adverse to any particular party in the industrial process. This is only to isolate the gains resulting from the application of productivity techniques, as such.

In order, further to clarify the issues involved, the points of view respectively of the employers and of the workers have been stated below, as they themselves would like to state their respective positions. The following paragraphs, therefore, do not reflect the NPC point of view but the parties' own point of view in practically their own language.

Employers' Point of View : (i) Productivity is essentially a Management responsibility, both under capitalistic as also socialistic arrangements. Management is a function with concentration on producing given products at the lowest possible cost. (ii) As increases in productivity are due to decisions taken by Management and are the result of their thinking and planning, Management can claim a sort of pre-emptive right on the gains of productivity. (iii) Labour is not entitled to share in the gains of productivity because it in fact resists the employment of productivity techniques. Labour is really not interested in cutting costs, mainly because the major element in manufacturing cost is the wages bill but also because

cutting costs generally means a heavier workload or greater carefulness in the handling of materials etc. (iv) Gains of productivity, being of a residuary nature, are really a part of profits to which the Management is entitled.

The Labour Point of View: (i) Productivity increases are not possible without the active cooperation of Labour. This cooperation can only be given on the very distinct understanding that the gains of productivity accrue to Labour, reasonable allowance being made for any costs involved in the installation or working of productivity techniques. Such prior understanding is essential, since the immediate gains of productivity accrue directly to the employers. (ii) In sharing the gains of productivity, it has to be taken into consideration that the present level of wages is sub-human. Paramountcy of the social interest, therefore, enjoins that the gains in productivity should in the first instance be devoted to raising wages to a fair wage level. Labour would, therefore, be agreeable to full participation in the achievement of productivity increases, provided a distinct understanding was arrived at that the gains in productivity would be devoted to raising their emoluments to a fair wage level. (iii) Disparities between the incomes of the working and owning classes are so large as to act as a disincentive to Labour. It is, therefore, essential, even purely as an incentive, that Labour's claim to the gains of productivity should be recognised in practice. (iv) The Directive Principles of State Policy, the general slant of the Indian Constitution and its requirements of citizenship, practically underwrite the claim of Labour to the gains of productivity. (v) While increase in productivity is wholly a plus factor for Management, it has, for Labour, two large minus signs: (a) an immediate reduction in the employment potential; and (b) an increase in the workload.

Both these points of view, that of labour as well as of management, have to be taken into account when any decision with regard to sharing the gains of productivity has to be taken. The NPC, however, would not like to minimise the difficulties involved in any such settlement. The fact is that the gains of productivity appear as part of gross profits. In most cases, they are largely of an indeterminate nature and the issues involved can only be settled as a matter of collective bargaining between employers and workers in a given firm.

The NPC is confident that given progressive management and good industrial relations, it should not be difficult to arrive at an equitable distribution of the gains of productivity, taking into consideration both the management as well as the labour points of view, elaborated in the preceding paragraphs.

In certain cases, however, where increase in productivity is directly attributable to the suggestion of a given employee or a group of employees, their pre-emptive right to a major share in the gains of productivity should be recognised. On the other hand where increases in productivity are due to management decisions, the employers would be entitled at least to the costs incurred and a part of the savings subject to the overriding condition that the workers are entitled to a minimum standard of living, both as workers and as citizens. In fact, if industry were to recognise the prior claim of minimum wages on its resources, the problem of sharing the gains of productivity would become less intractable than it is.

With regard to this problem, the NPC point of view was put forward by Dr. Lokanathan at the last NPC Conference on Productivity,* while emphasising the importance of the human factor in productivity increases: "... I think, if I may say so, this is the one way by which we can resolve most of our difficulties.... Every person has children and these children have to be educated; they must also have a house to live in. If the employers feel this way and look at it from this point of view, the sharing of the gains of productivity becomes easier, because whatever may be said, *there is a basic minimum which has got to be provided and it has to be provided from industry..*"

* See the article on NPC, page 336.

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PRODUCTIVITY PRAYER

"Lord ... Keep me from getting talkative and particularly from the fatal habit of thinking I must say something on every subject and on every occasion ... Release me from craving to try to straighten out everybody's affairs ... Keep my mind free from the recital of endless details—**give me wings to get to the point** ... Teach me the glorious lesson that occasionally it is possible that I may be mistaken ... Keep me reasonably sweet; I do not want to be a saint: some of them are so hard to live with; but a sour old woman is one of the crowning works of the devil ... Make me thoughtful, but not moody; helpful but not bossy ... With my vast store of wisdom, it seems a pity not to use it all—but thou knowest, Lord that I want a few friends at the end ...".

Productivity and Human Relations

V K R V RAO*

More than any other country in the world, we in India are faced with the problem of productivity in industry: more than any other country in the world because we do not have a plenitude of capital resources. Our investment funds, whether of domestic origin or obtained from abroad, are grossly inadequate from the point of view of the industrial requirements of the country. This means in turn that we have to lean more heavily on the power of our human-beings, on the skill, steadfastness, discipline, enthusiasm and capacity of the human factor, which means both labour and management. In view of the greater reliance that we in this country have got to place on the human factor for the increase of productivity, it is particularly important that we should try and examine what we may call the human aspect of productivity.

THERE is no need to dwell upon the importance, for us, of increase in productivity. With our high rate of increase in population, unless productivity increases much faster than the increase in population and also sufficiently faster both to afford an increase in saving and an increase in consumption standards, our economic future is very bleak indeed. Sometimes people do not realise the extent or the magnitude of the problem that is involved in Indian economic development. For example, when we talk of the increase in national income, whether the increase contemplated is 3 or 4 or 5 per cent per year, whatever the figure may be, a part of the increase in that national income automatically gets absorbed by the increase in population; and the rate of increase in population is estimated at something like 1.8 per cent in a year. In other words, something of the order of 2 per cent of the national income increase is required merely for the purpose of maintaining the *status quo*, merely for the purpose of looking after the needs of the increased population. Therefore, whatever be the rate of increase in national income, some-

thing of the order of 2 per cent can be written off, so to speak, right from the start. What is left to handle is really that part of the increase in national income, which is in excess of 2 per cent and everybody knows that even an increase of 2 per cent in national income is a high rate of economic growth.

From the increase that would take place in excess of this 2 per cent, we have to find the increase in the rate of saving. We have to increase the rate of saving which now stands or is supposed to stand at—nobody really knows—around 8 to 8½ per cent. From that, the domestic rate of saving has to be increased to something like 17 per cent in the course of another ten years or so.

This increase in the rate of saving is derived from the increase in the rate of national income which has also to bear some increase in consumption. Without some increase in consumption, without some increase in living standards, we cannot get any increased productivity at all or to stimulate any enthusiasm or co-operation or industrial discipline. Obviously, the masses of the working population would demand—and one cannot blame them for that—that at least some

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increase should take place in their current levels of consumption. Putting all these things together, we will need a rate of increase in national income of not less than 4 per cent a year or probably something like 5 per cent a year, if we really want to get through the project of doubling the national income by 1971, or doubling the per capita income by 1974, which means about 30 per cent every quinquennium.

How is this increase to be brought about? Obviously, this cannot be done only through agriculture. No doubt, we will have increase in agricultural production, but this will not be of the order required to finance both the required increases in consumption and in saving; nor will the tertiary sector give us the required increase in real terms. We have therefore to turn to industry as the major factor in economic growth. Industry alone can give the nation a regular and sufficiently high rate of addition to the national income. In fact, this has been so even during the first eight years of planned economy, and it has got to be still more so during the third and subsequent plan periods. The annual order of increase required in industrial production would be ten to twelve per cent; and this increase is to be brought about solely as the result of increased investment. The volume of capital required for this purpose would be beyond our resources, either domestic or foreign. Everybody knows about the vast gaps between investment and returns and even if we have the enormous capital which may be required for effecting an increase of 10 to 12 per cent in output, it will take quite a while before the increased capital equipment makes itself felt sufficiently in terms of increased income.

It is therefore absolutely essential that we should turn our attention to increase in productivity through better organisation of the human material in industry—it is almost a matter of life and

death for us in India today, much more than in any other country—the organisation of the human material in industry in such a manner as to bring about only through such reorganisation, all other things being given, an increase in productivity of not less than 3 to 4 per cent or 5 per cent a year. In other words, we want to solve the human problem in industry so that productivity is increased by about 4 to 5 per cent without any extra investment or capital—either domestic or foreign. To my mind this increase in productivity in industry by a sensible handling of the human factor is one of the most important requirements for successful planning in India.

It is really a pity that what we call the 'human factor' in economic development has received so little attention in India at the hands of both the planners and the economists. There is far too much of a mechanistic approach to economic development in this country and everyone seems to think that economic development merely means having more capital so that if we invest x , we automatically get the increase in national income of $x/3$ or $x/4$ or some other fraction. Certainly that kind of mechanistic approach to planning is not going to solve the problem of Indian economic development.

It is therefore a very good thing that the National Productivity Council and the local productivity councils, like the one we have at Delhi, are devoting time and energy to the discussion of this subject of human relations in industry; because by the human factor being made more rational, more cooperative, more organised, more disciplined, it should be possible for us at any rate to make some dent on the problem of the growth of India's national income.

The question is: what should we do about it? What is this human factor? How should we handle it? In the more developed countries, the problem is a

little simpler than in India, because ownership has become more or less divorced from management. The managerial class has become quite a professional technical class, which is different, by and large, from the class that owns the shares, owns the capital and obtains dividends as a result of the profits of the concerns with which they are associated. But when we come to India, it is not a straight-forward question of labour and management. We have got here, what may be called, an owner class, which is actively engaged in management or exercises over it control that blurs the responsibility of the management. Then we have got the management class, and what may be called, the labour class. The human factor does not however consist only of these three, of what may be called, the internal human factor, that is, internal to industry.

Over and above, we have got the other factors, which may be classed as the external human factor. That would include, for example, the attitude of the Government, the attitude of the Press, the attitude of political leaders in the opposition. As far as internal factors are concerned, we have got the trade-union leadership, the management associations which are just coming into existence and are still not a powerful force, and then we have got the employers' federation. These three bodies constitute the internal factor. But over and above these, the human factor also includes the attitude of members of Government, their attitude to industry and to all these three classes, the speeches that they make, the kind of incentives they give as also the kind of pats on the back and so on. These are all very relevant factors.

Thus industrial psychology is inevitably affected by what happens outside in terms of governmental policy, in terms of the press, and also in terms of what analysis the press makes of industrial problems; the kind of education the press gives to the people about industrial problems; the kind of factors which

the press highlights in regard to industrial disputes or in regard to the background of industrial problems. Hence the press, and also the governmental leaders and the opposition leaders have quite an influence on the people, working in industry.

This human factor is really something very extensive and stretches far beyond the actual participants in industry. In some of the more industrialised countries, the human factor extends even farther. Taking the USA for example, the university people play a very important part in regard to the settlement of industrial disputes. As a matter of fact, university people arbitrate, they influence public opinion, examine industrial issues and try to bring about settlement of industrial problems. Most of the literature which is produced for example on human problems in industry has been produced by academicians in the USA or in the UK or in other industrially advanced countries. But in our country, by and large, universities have practically said nothing on the subject of human factor in industry. They think, this is something which should be left to the managerial or employer class or the labour organisations. The university man, the academician or the economist does not think he has got any role to play or any part at all in this particular problem of the human factor in industry. But they really constitute a part of this human factor in industry, which means we have got to cover a very wide range, when we talk of the human factor in industry.

Unless there is understanding between all these human factors, that is to say, unless there is understanding between governmental pronouncements, between opposition pronouncements, between the attitudes of the press, the position taken up by the university bodies and academicians, and then between employers, management and labour—unless there is some kind of understanding

between all these various segments of the human factor, it would be very difficult to bring about the kind of increase in productivity that is required by the Indian economic situation.

We may have a situation in which the employer, the manager and the labour may all come to a good understanding, but the whole picture may change because of a governmental or even an opposition announcement not necessarily concerning productivity. Therefore, when we consider this human factor in industry in relation to productivity, we have to emphasize that a certain responsibility rests on each and every one who has got authority or position or influence on the public, who deals with problems of industry. If we want to increase productivity in India through a reorientation and reorganisation of the human factor, certain basic conditions need to be fulfilled. There is an undeniable need for a code of conduct which the politicians—both ministerial and opposition—must observe, a code of conduct that among other things must be bound by the requirements of industrial productivity, that is to say, by the requirements of creating an atmosphere of understanding, an atmosphere of conciliation, partnership and participation: an atmosphere generally of cooperation.

As long as we have a mixed economy, as long as we have private enterprise, it is imperative that private enterprise must get a chance to develop. But if we have private enterprise and have its hands tied, then it would be better not to have any private enterprise at all. Even if we have only public enterprise, the human factor is not going to disappear. As a matter of fact, human factor in some ways becomes more important in public enterprise. We cannot escape the human factor merely by substituting public enterprise for private enterprise. The first requirement, therefore, for increasing productivity is that political power must be circumscribed by the requirement of creating an at-

mosphere of cooperation and participation with emphasis on productivity and production rather than on what one may call sectarian or factional or individual rights and requirements. A violent atmosphere is not at all the background against which we can bring about the organisation and cooperation of the human factors for the purpose of economic development. Therefore, I would like to emphasize this point that whatever our position may be, we all have got a role in creating the necessary atmosphere for increasing productivity.

One or two other points may be made, apart from giving workers decent conditions of work. The most important thing is to create a feeling in labour that justice is being done to the worker, because nothing is more conducive to frustration and, therefore, to a non-utilisation of one's talent to the maximum, than a feeling of injustice. And this kind of injustice arises when people feel they are not getting a fair deal, that if they work hard they get no appreciation, or if they do not work hard also, it does not affect them adversely either; that all industrial promotions, industrial discipline, industrial rewards and everything else become a subject of pressure. The moment rewards become the result of pressure whether it is reward for the worker or anybody else—the moment pressure rather than efficiency becomes the determining factor, it is very difficult to use the human factor for the purpose of increasing productivity. The human factor can be used for the purpose of increasing productivity only when the industrial organisation is such that reward is the return to efficiency. But if reward is the return to pressure, then undoubtedly people will use pressure for getting rewards rather than work harder.

This is human nature, and this is the most important reason why in India productivity is not as high as it should be, whether in the public sector or in the private sector. It is because, by and

large, pressure rather than work, is what people think determines the quantum of rewards. Unless this vicious circle is broken, unless the situation is established when better work means better reward and poor work means poor reward and no one is allowed to intervene for giving more to somebody who does not deserve it and for giving less to somebody who deserves more, only then would it be possible to think in terms of efficiency and purposive utilisation of the human factor. This is the most important requirement for increasing productivity in industry; this applies not only to the private sector, it also applies, to a large extent, to the public sector. In the private sector it may be a question of nepotism, it may be a question of casteism, it may be a question of relations, and so on. In the public sector it becomes a question of public pressures, a matter of party interest, of satisfying the electorate and satisfying one's constituents.

Both in the private sector and the public sector the factors that determine efficiency are rewards, promotions, status, appreciation and other allied kinds of incentives. These are the things which stimulate people to work harder. As far as these are concerned, in the public sector too, they are influenced by pressures rather than by objective economic considerations. Someday, this question has got to be discussed in great detail. It is good that we are extending the public sector. Such an extension of the public sector is desirable. At the same time, it is a fact that merely extending the public sector does not solve any economic problem. With every extension of the problem of the human factor in industry—the problem of incentives, rewards, promotions, status, and pressures—some device has to be found in order to prevent politics from dictating industrial efficiency. Sooner or later, very detailed attention will have to be given as to how to make economic incentives and economic criteria operate in regard to rewards

in the public sector rather than pressures of one political kind or another.

The next important point—and it is really applicable even more to the public sector because the problem of human factor in industry has become much more important with the extension of the public sector—is training and education, and it is a great pity that, even after 12 years since we got independence, so little has been done in regard to the subject of adult education and workers' education. There has been a good deal of expansion of primary education and also of university education. But what about adult education? If we take railways, plantations, and all other industries and factories, the total number of workers comes to nearly a crore. How many of these people can read and write? How are we going to influence them, because we have got to communicate with them, because unless there is cooperation between the management and the workers, unless it is possible for labour to know what it is all about, not in terms of what it is doing but also what are the *pros* and *cons* of the various issues, unless here is a sort of channel of communication between the workers and the management, it is difficult to see how we are going to solve the problem of orienting the human factor from the point of view of efficiency.

We have talked of adult education, literacy classes and so on. But in actual practice very little has been done. We need worker literacy not only from the narrow point of view of enabling the workers to acquire the skills needed for economic development, but even more from the point of view of human relations, of establishing communication between the workers and the management and promoting intelligent discussion of industrial problems. Apart from this, industries have an obligation to their workers in the matter of worker education and this should be the primary job of their public relations officers. Their real job should be to explain things to

the workers, stimulate their understanding of the working of industry and thus help to promote an increase in productivity. We need, therefore, enquire seriously into the functions and working of public relations officers in all branches of industry, public and private and in Government departments. If we want productivity in industry to increase, it is necessary to find out how far they are successful in educating their workers in the meaning of what they are doing and the how and why of their specific industrial activity. Education and the understanding that follows education should be the basis of industrial discipline, not resort to the coercive processes of the state.

One thing more is required from the point of view of reorienting the human factor in the direction of increased efficiency. That is, in a society like ours, if we want to influence the masses, we can only influence them by example and not by exhortation. This is a fundamental law of human relations in industry. If we want to influence workers, exhortations will not do, but it is example that is required and example means one's own personal conduct. There is little use proclaiming that there should be economy, there should be austerity and all that. That person alone can teach who can set an example. And it is only by setting an example that we can influence others. In fact this is actually, if one may be permitted to say, the teaching of the Bhagwat Gita: "Whatever a great man does, the same is done by others as well. Whatever standard he sets, the world follows." In other words, we are told that those who occupy positions of power or authority or influence have got to act in such a way, that the rest of the community should be inspired by their conduct and example. That also applies to what may be called human relations or human factor in industry.

Even more important is the basic pro-

blem: the enormous disparity between the rewards of the lowest worker and the rewards of the highest worker, including the entrepreneur and capitalist. Taking a country like Australia, the difference is not so much between these two—it may be £100 to £500. In most cases they do not get more than £5000 a year. In India this problem of inequality does not merely apply to profits; it is also a question of the sharp divergence in rewards between the managerial profession, members of the upper-middle class and the rewards that are given to the workers at lower levels. We cannot have this large disparity if we want to solve the problem of industrial productivity in India. It is no use saying that this simply means the sharing of poverty. Even if it does, sharing of poverty may be a requirement for the purpose of getting the necessary impetus amongst the vast masses of our people.

This, of course, poses certain difficult problems in industry. If we want to raise the wages of workers, how will we finance the expanding industry? There are other aspects of the problem: with the acceptance of Indianisation in the higher branches of industry, Indians are now being given the salaries and allowances that were formerly given to Europeans and they are expected to have a way of life as different from and superior to that of the rest of their countrymen as were the ways of European executives of business firms in India in the pre-independence period. This is not going to help in increasing productivity in Indian industry, certainly not in the long run. Temporarily it may help industry, but inevitably it is creating a new class with attitudes and behaviour, unsuited either to the country or its economy and it is going to make industrialisation very expensive, apart from promoting discontent among the working class. It is high time that industry, specially in the private sector, began paying serious attention to the whole problem of comparative scales of wages, salaries

and profits not only from the point of view of incentives for the individuals at the top or in the higher ranges of the industrial ladder, but much more from the point of view of the industry as a whole including all the classes engaged therein and also from the point of view of the effect it is going to have on the costs of further industrialisation and therefore on the politics of economic development itself.

Summing up: increase in industrial

productivity has to rest to a large extent on the proper handling of the human factor in industry and this may require a resort to unorthodox ways some of which have been elaborated above. The importance of considering and properly handling the human factor has become even greater not only because of the vast scale on which we are trying to have economic development in India but also because of the increasingly important place that we are giving to the public sector in this development.

* * *

PRODUCTIVITY MOTIVATION

"If there is one thing that modern psychology makes clear, it is this: men cannot be motivated successfully to work hard, or to learn well, simply by putting the screws upon them. The starvation theory of wages may or may not have been abandoned in actual industrial practice, but it is certain that other theories of social punishment, and of economic pressure, other theories that men will work hard and well only when they are compelled to, by economic or legal necessity are still very popular. But the analysis of our system of economic and social prestige, as well as the findings of psychologists, make it clear to any realist that men work hard and learn well only when they have been trained to work for increasing rewards.

"In order to make underprivileged people anxious to work harder and willing to bear more responsibility on the job, our industry, business, and government must convince them that they can get more out of life than they now get."

From INDUSTRY AND SOCIETY by William Foote Whyte

Productivity and Employment

GEORGE V HAYTHORNE*

Productivity has been receiving increasing attention in many countries during recent years. More people are realizing its importance both from an economic and a more broadly social point of view. The problem of employment, on the other hand, has received serious attention since the Great Depression of the Thirties. It is time that both these problems—Productivity and Employment—were looked at together so that we may be able to evolve a socially fruitful policy that would simultaneously promote productivity as well as employment.

MANY of the relationships between productivity and employment are complex. Partly because of this they can best be considered, initially at least, on a broad plane. Before doing this, it may be helpful to remind ourselves what is usually conveyed by each of these terms. Employment, to take the second term first, has a straightforward and easily understandable meaning. It is the work or services performed by wage and salaried employees and also, in a broad sense, by own-account workers and by unpaid family workers.

Although the basic meaning is clear, it is important to note that there are varying degrees of employment from occupation to occupation, from season to season, from industry to industry, from region to region and from country to country. The amount of work performed is a function also of the hours worked per day or per week, of the proportion of full-time, part-time, short-time or over-time work and of the continuity of the job: that is whether it requires steady or casual work. The quality of employment varies sharply depending on a number of factors. These include skill, experience, training, working conditions and health. The quantity of employment is also dependent on the factors just listed and both the quantity and

quality are dependent on the tools, instruments, equipment and machinery available, on safety measures in the plant and on employee morale including labour-management relations.

The characteristics of the labour force have an important bearing on the degree of utilization of manpower. This is a particularly important consideration, as will be seen more clearly later, with respect to productivity. In under-developed countries, and in under-developed areas of Canada, productivity ratios are low essentially because of under-employment of resources, including human resources. People may in fact work long hours and a high proportion of the total labour force may be employed but they may produce relatively little per man because of poor organization, low level of technology and poor distribution of resources. In other words, the level of employment in relation to the total labour force should not necessarily be maximized in order to secure greater economic welfare or an optimum standard of living.

The term productivity is a little more difficult to understand. This is partly because it is used in a variety of ways but I think mainly because it tends to be confused with the word production. The essential difference between productivity and production is that the former is a ratio whereas the latter refers to output

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expressed usually in absolute physical or value amounts. As a ratio, productivity relates output to input and as such is an indicator of the over-all efficiency of a firm, an industry or an economy. I want to stress *over-all* efficiency since the word productivity is sometimes used to refer to the contribution of individual input items, or production factors such as labour, raw materials, capital and various other items. This is apt to be a misleading use of the term.

A large number of factors and the way in which they are combined contribute to productivity improvements. The ratio of input to output is not intended, in other words, nor is it able to measure the unique contribution of any one input factor. It is convenient, however, in most cases to use one input factor, usually labour, in compiling a measure of productivity change. The input factor in this case, which may be man-years, man-days or man-hours, is used in the denominator of the ratio. In other words, the ratio reads output, say so many thousand board feet of lumber, per man-hour. Labour is generally used in compiling measurements of productivity because of its relative homogeneity and the availability of suitable data. The labour input is itself, however, often far from homogeneous depending on levels of skill, attitudes towards work and a host of other considerations. Besides, broadly speaking, labour includes the competence of management as well as that of plant and other employees.

In using labour as the input factor, or any alternative input factor for that matter, it must be kept in mind that other input factors also contribute to the total result. These include: investment, extent and suitability of machinery and equipment, technological changes, size and organization of the plant, the capacity of the plant utilized, the quality, availability and accessibility of raw materials, energy consumed and adequacy and price of transportation, distribution and other services. There are also influences on the output side, such as

product mix, and the demand for the products, which can have an important effect on productivity.

It is perhaps worth noting before leaving this point that output per man may actually go up without there being any economic gain. This can happen, for example, when the added cost of new equipment more than offsets any saving in labour cost.

A further introductory consideration which should be noted is that it is the changes in productivity from time to time or the differences in productivity as between plants, industries, regions or countries that are usually more important than the measurements of the input-output ratio at a specific time or place.

It is perhaps obvious but nevertheless might be stressed that before improvements can be made in productivity, there must first be a productive operation—a plant, an industry or an economy with the necessary input factors and an output. In countries where manufacturing and some other types of industrial development are just beginning, it is not too realistic to talk about widespread productivity improvements and their effects.

In countries where secondary industries have had a longer period of growth, the task of bringing about productivity improvements poses a variety of problems.

In Europe, age, size and tradition stand in the way of productivity gains in many plants. On the other hand, the widespread devastation of World War II has given rise to many far-reaching changes, including many plants where productivity is high. It is true too, and this brings us closer to the relationship between productivity and employment, that in some European countries, notably Switzerland, the development of a highly skilled labour force has contributed a great deal to productivity improvements over recent decades.

In some parts of the United States, industrial establishments tend to be old

and small but generally speaking they are large and well equipped in keeping with the size of the American market and the rapid advance in technology.

In Canada our position tends to fall between that in the newly developing and the older developed countries. With a large production base on which to build in most parts of the country, we are becoming more concerned with improvements in our methods of producing and selling goods than in bringing productive resources into use but the task of improving productivity poses some difficult questions for us partly because of our size, our location geographically, the distribution of our resources and our position as a trading nation.

During recent decades, there has been a marked over-all improvement in productivity in Canada. This increase has been shared by most industries and by most areas of the country. It has been particularly striking in agriculture.

According to recent estimates output per man and also output per man-hour in agriculture have been increasing at somewhat over five per cent annually since 1946. This is about double the annual rate over a longer period from 1926 to 1958. Output per man in the non-agricultural sector of the economy has shown a slower rate of change than it has in agriculture. The annual improvement since 1946 has been 1.1 per cent. Over the longer period since 1926 it has been 1.4 per cent which again unlike agriculture, is higher than during the post-war years.

The productivity changes, it should be noted, have not been positive every year either in agricultural or in non-agricultural sectors. During the worst depression years of the thirties and in some of the post war recession years the changes have been negative. The positive changes, however, far outweigh the negative ones. Among the principal reasons for this might be noted the large demand for goods and services during and after World War II, an impressive

programme of capital investment in many industries, important technological advances stimulated partly by far-reaching scientific advances in the field of atomic energy, more highly skilled manpower, including immigration, and relative stability in the economy to which government policies have been a contributing factor.

While these gains have been occurring in productivity there has also been a steady growth in employment. In the private sector of the economy, that is excluding government at all levels and military operations, average annual employment has increased from 3,327,000 in 1926 to 5,291,000 in 1958. This gain of close to 2,000,000 represents an annual growth of 1.5 per cent over the 32 years. The growth since 1946 has been only slightly higher at 1.6 per cent.

There may appear at first glance to be a conflict between these increases that have been occurring in productivity and in employment at the same time. If in an individual industry with a given level of output, productivity goes up, employment must go down. Sometimes even when output goes up, employment goes down. This in fact is what has occurred on a large scale in Canadian agriculture.

It is, however, quite possible for both productivity and employment to go up, if not in the same industry, in a second or third industry as a result of increased output in the first one. There has been, for example, a large increase in processing, handling and distributing farm products in Canada during recent decades which has required much more off-farm employment.

There has also been a steady shortening in the length of the work week in the non-agricultural sector from close to 50 hours in 1926 to 40 hours in 1958. Meanwhile the decline in agriculture has been from around 64 to 54 hours per week. Although there is no precise method of measurement, it is generally agreed that these reductions in hours of work have had a positive influence on both produc-

tivity and employment. The improvements in productivity in the economy generally have enabled reductions in hours while reduction in hours has itself encouraged an increased demand for recreational and other goods and services which in turn may have a reciprocal beneficial effect on productivity and employment.

There are important industrial and regional variations in productivity. These, we know, exist but it has not yet been possible to develop satisfactory data for measuring either changes in productivity in the same industry or region over time or differences between industries and regions at the same time. The Dominion Bureau of Statistics is actively engaged in developing more satisfactory data in this connection. When they are available, they will enable much more refined analyses.

In the meantime, we do know that such factors as population density, access to and utilization of resources, the tendency of some high productivity industries to be located in the more fully developed industrial areas, levels of skill in the labour force and the presence of marginal manpower groups, all have an important bearing on these variations in productivity and employment in industries and regions.

During 1958 and the first half of 1959, the evidence which we now have available suggests rather rapid further gains in both productivity and employment. Such gains are not unusual as the economy comes out of a recession. They arise partly from an increase in the use of productive capacity in response to stepped-up demand for goods and services and partly from a tendency on the part of employers to conserve labour and other resources as much as possible during the recession period. Moreover, with increased demand and a relatively easy supply situation, there have not been the same pressures on costs under these conditions of increasing productivity.

As we move into 1960, it is possible

that the rate of productivity gain may fall off somewhat so that this is a time when attention to productivity is particularly timely. The steps that can be taken to increase productivity and employment might be grouped in three broad categories: manpower, technological change, and employer-employee relations.

In the field of manpower, there are several measures which can be taken to improve the skills of workers which in turn can result in higher productivity, greater output and increased employment. These measures include stepped-up apprenticeship training, improved technical schools and closer ties between educational institutions and in-plant training.

Larger firms particularly are recognizing the need for more technically and professionally trained workers and for research competence in the case of more of those in the latter group. The number of firms with research departments is still not large in the aggregate but the growth of this aspect of industrial operations and the increasing support which firms generally are giving to education at all levels are indicative of the greater attention being paid to scientific developments and to the importance of human resources.

A related development is the growth of personnel and industrial relations departments again mostly in our larger firms. These departments are encouraging a more efficient use of manpower and of the equipment with which men and women work. Governments and especially universities, through courses in business management and in industrial relations, have helped to stimulate this development.

Labour mobility is another important manpower consideration. Steps are being taken in Canada both by governments and by industries to encourage movements of manpower where these are in the interest of workers, their families and the economy generally. The

National Employment Service is making a major contribution in this regard through helping to bring together, on the basis of careful selection and references, job seekers and employers with known job openings. There are, however, some serious road blocks, such as pension arrangements, seniority plans, inadequate housing and community facilities in some cases, and numerous personal and social attachments to existing locations which are understandable but which need to be looked at from a broader and longer-run point of view.

Technological changes, including automation, and their implications comprise a second field which requires continuous examination in all industries. A wide range of problems are posed in this area which bear on productivity and employment. Many can only be resolved through careful studies which bring out clearly the economic as well as the engineering aspects.

In a number of European countries, the development of productivity centres, work study institutes and industrial research establishments have grown rapidly in response to developing needs in this and related fields. Some of our Canadian industries have established somewhat similar agencies, for example, the Pulp and Paper Research Institute in Montreal and the Primary Textiles Institute in Toronto. Whatever pattern is evolved to suit our Canadian conditions it is clear that greater attention to efficient plant organization becomes more essential with automation and other forms of technological change and highly competitive market conditions.

A third broad area which requires close attention when considering productivity and employment is employer-employee relations. This includes not only the more conventional aspects of such relations including wages and other collective bargaining items but also working conditions, employee morale and the general health and spirit of workers. In this connection, it might be noted that

increases in wages or reductions in hours of work do on occasions stimulate improvements in productivity. Decisions reached through collective bargaining, in other words, sometimes put added pressure on management to use more or better types of equipment and to organize production more efficiently to meet a higher wage cost. This pressure may be felt directly in a plant or indirectly through competition.

The possibility of wage advances varies of course both with the industry or firm and with changing conditions over time, though, in general, it can be said that there is a positive correlation between rising wages and rising productivity. It cannot be asserted dogmatically that one is the cause of the other but it is clear there are important inter-reactions between them even though changes in each are frequently due more to other factors.

Because of these other influences and also because it is desirable that the benefits of increased productivity be widely shared, it is not usually sound to establish any direct mathematical relationship between productivity and wage increases. It can be said though that when money wages rise faster than productivity, prices or costs may rise and when real wages, at least over time, rise faster than productivity, wage earners may tend to gain at the expense of other income recipients.

While pressures from unions or from management to stimulate increased productivity usually have a beneficial effect on the industry in question, and on the economy generally, this does not necessarily follow. Improvements in productivity, it must be remembered, are not ends in themselves. They are rather means of promoting a sound and healthy economy, which will enable people in turn to improve their standards of living and so help them to contribute to and enjoy a fuller life.

If the drive for productivity improvements is made, for example, through

technological change without recognizing that serious human relations problems are also involved, managements can expect to run into difficulties with their employees and their unions. If unions and management in their desire to reap the benefits of productivity improvements, act without recognizing that consumers too have a legitimate claim on such benefits, they are likely by their actions to limit seriously the possibility of further productivity gains. If the only result of reduced hours of work in an industry is moonlighting, there can be some question both about the gains in productivity and the beneficial effect on employment. Similarly if unions or management insist on out-moded working conditions or employment arrangements this can interfere with productivity gains.

On the more positive side, it is becoming more generally accepted that it is not in the separate or joint interests of unions or management to put barriers in the way of increasing productivity at the bargaining table or elsewhere. Progress in this respect is by no means uniform in all industries and areas but more people on both sides are recognizing that there are many ways in which unions and management can contribute to improvements in productivity. When these various efforts are made within a general atmosphere of good human relations in a plant they are likely to be most productive.

Management and unions each have their own separate and distinct interests but these interests can and do converge when promoting improvements in productivity. There is also a wider appreciation of the fact that their joint interests in this respect coincide with those of the community and of the economy generally and that a generally improved standard of living itself stimulates further improvements in both productivity and employment.

These are healthy signs. It is also healthy that these matters are being dis-

cussed more frequently and more fully not only in industrial, regional and national settings but also internationally. The International Labour Organization, the European Productivity Agency, established as part of the Organization for European Economic Cooperation and other agencies have stimulated an increasing number of discussions in these areas on a tripartite basis during recent years.

In addition to these three broad areas in which steps can be taken to increase productivity and employment, namely manpower, technological change and labour-management relations, there are other measures which might be mentioned briefly. Not that they have a less important bearing on productivity and employment but rather, with an eye to brevity, they have a somewhat less direct connection with employment. These include resource development, growth of domestic and international trade, standardization or differentiation of products, taxation and other fiscal policies, and economic policy generally.

Within this broad array of measures which may be taken to increase productivity and employment, it might be asked what specifically is the role of government in promoting this objective. While the major responsibility for such increases rests with industry there are certain ways in which governments can assist. Among these, five types of action may be singled out. The first of these activities is the promotion of training of industrial workers on all levels of skill. Our Federal Department of Labour works closely with the provincial departments of education and of labour in this respect. As a result of this association and of research work we have been undertaking recently on changing requirements of skilled manpower in Canadian industries, it has become clear to us that a rather wide gap sometimes develops between industrial needs on the one side and educational and training facilities on the other. Departments of trade and industry are in some cases no doubt now

helping to interpret these changing skill requirements to those responsible for technical and professional training facilities in the provinces and, on the other hand, making clear to industry what opportunities exist for assistance in this important area.

Perhaps there is more that the departments can do through keeping in close touch with both of these groups, in respect of training not only for young workers and for presently employed workers but also for those who are unemployed, particularly those older workers who, as "technological change casualties," require retraining. Increased liaison of this type would over time make a distinct contribution to improvements both in productivity and in employment.

A second way in which governments can assist is through maintaining an active interest in important technological changes which are taking place and in the ways in which these can best be applied in industry. The Department of Trade and Commerce, the National Research Council and several other technical departments of the federal government are in a position to assist in this regard but it is the provincial departments which are often closest to the opportunities and the needs of local plants and industries. They have a close contact with industry, but there may be ways in which both provincial and federal departments can assist further in encouraging technical improvements in existing or in new plants and industries in Canada or elsewhere.

On the technical manpower side if the federal government, either through the National Employment Service or otherwise, can assist in locating people urgently needed in new locations or in assisting in the movements of workers who should find another location, it will greatly further the public interest.

A third activity is research into economic and social conditions, a knowledge of which is essential in developing sound long range programmes in industries and

establishments. In some cases, it may be important for governments to undertake such research. In other cases, it is rather a matter of encouraging industries, universities or other agencies to undertake studies. This is a key area for activity. We cannot get far in developing sound programmes unless we are fully aware of the types of problems and conditions for which the programmes are required.

A fourth field of activity closely related to the last one is the provision of basic information required for intelligent decisions on the part of industrial leaders. Increasingly in our complex industrial society governments are called upon to furnish up-to-date and accurate information on a wide variety of subjects. In Canada, the Department of Labour has information on many aspects of labour and working conditions ever since the department was first established in 1900. The demand for this information which is supplied on a strictly impartial basis to management, unions and to all others interested, has been steadily increasing.

The Department of Trade and Commerce, particularly through the Bureau of Statistics, furnishes data on a much wider range of subject matter. Provincial governments also supply much information on which business decisions are made. These services, while perhaps not always fully appreciated, are highly important to industries and to the country as a whole.

Good information enables good decisions. Poor information can easily lead to bad decisions. When employers, for example, misjudge consumer demand, labour market developments, or the availability of key raw materials, or are misinformed about government policies, serious mistakes can follow. On the other hand, when wise decisions are made they are not only beneficial to industry but are advantageous to all. They make for improvements in productivity and for a higher level of employment.

Finally there are efforts which gov-

ernments can encourage on the part of individual plants to promote productivity and indirectly at least employment. Productivity and work study centres in other countries are helping in this direction. These have been fostered through joint industry and government efforts and we have derived much stimulus from them through a close association built up over the years with the European Productivity Agency and OEEC. In Canada, the Labour—Management Co-operation committees developed during the war and post-war years have been making a contribution in this re-

gard.

There are today some 1536 of these joint consultative committees in individual plants across Canada. Representatives of both unions and management serve on each committee. The Federal Department of Labour encourages their establishment and maintains close contact with them. These joint committees have helped in many cases in the past to develop a good working atmosphere in the plant. There may be other ways in which they can assist in promoting improvements in productivity in the future.

PUSH BACK YOUR FATIGUE POINT

William James, the famous philosopher, offered convincing evidence that most of us get tired every day not because of actual effort expended but because we make a habit of feeling fatigued at a certain hour, or after a certain amount of activity. This self-imposed limit, called the fatigue point, is far below the stage of real exhaustion. Some of us are really tired, but far more of us would not be tired at all unless we had got into a wretched trick of feeling tired by following the prevalent habit of vocalization and expression (talking or behaving in a tired manner) . . . We are used to being exhausted at the time our office closes, for example, and so at 5 p.m. each day we walk or slump in a tired manner, put on a tired expression or tell people how tired we are and this makes us feel tired. But it's just a bad habit. The busiest man needs no more hours of rest than the idler. **As a rule, men habitually use only a small part of the powers which they actually possess.**

Most people can, if they wish, push back their fatigue point by noting the time each day when they seem tired out, then deliberately trying to go on to a later hour every day, thus establishing a new fatigue pattern. Your system comes to expect that you will work a little longer and accomplish a little more each day before it is time to feel tired, and you will acquire the habit of achieving more without feeling that you are driving yourself.

Second, Third and fourth wind: William James came to his conclusion about fatigue points through the study of the well-known phenomenon of 'second wind,' that burst of new energy which sometimes comes when a person continues working on through deep fatigue. James discovered that they may occur more than once; he speaks of getting your third or even your fourth wind . . . The results achieved in such orgies of work are sometimes superior to those accomplished in a series of shorter periods perhaps because we get so wound up and full of our subject that we see it whole.

Productivity in Indian Industry

Employers' Point of View

NAVAL H TATA

As I write this, my thoughts go back to my early association with the ILO (Geneva) where, several years back, the first studies in productivity were initiated. It was painful to me to find my country right at the bottom of the scale in per capita earnings; and I found the workers' representatives from other countries looking at me in amazement suggesting that we employers were giving a very poor wage to hard-working people of our own country, taking into consideration the wage tables published by the ILO. It was apparent that they had not taken into consideration the productivity of labour; and no attempt had been made to establish a co-relation between wages and workloads. At the same time I had occasion to visit a small railway station (Mez) in Switzerland where I found that a single woman in charge of the railway station was doing all the work that is done by several persons (station master, ticket collector, gate keeper, sweeper, waterman, signaller etc.) on the smallest railway station in India. Therefore, in considering this question of productivity we have to take the workloads into consideration, for eastern workloads can only earn eastern wages, subject to the overall productivity of the economy, whereas western workloads alone can earn western wage rates. It is not enough that a country should produce, but it is essential that it should produce at a cost, using the best resources.

OUR country is in the midst of its development plans where the energies and resources of the nation are concentrated on national well-being. At such a juncture in India's history, productivity is an instrument of great purpose and value.

At a time when our resources and credits are fully stretched, it would be in the national interest to get the maximum production from the existing national assets in the form of plant, machinery and man-power. Capital equipment is getting expensive day by day, and our need for economising on our foreign exchanges is so vital that it

would pay us handsome dividends, if our industry could give us its maximum output through intensive operation. It would be an interesting study to find out how far the output of our various industries compares with the optimum output guaranteed by the manufacturers as indicated by the installed capacity, through intensive operation of all units.

Putting aside the case of industries which have to work round the clock for 365 days, there are numerous industries where the output could be substantially increased through multi-shift working of the same equipment. With proper

maintenance and quick replacement of spares, a plant, in some industries at least, can give an output, by three-shift working, approximately 2 to 3 times the output based on single-shift working.

According to the revised estimates prepared by the Planning Commission, India's population will be about 431 million. It was originally assumed that population would grow at the rate of 1.58% between 1956-61; but the rate of growth is now estimated at 1.91%. With our mounting population, estimated to number 527 million by the end of 1971, India will need enormous consumer and capital goods to satisfy the increasing demand from the fast multiplying millions, and the question arises whether our nation can afford the luxury of duplicating or increasing the number of plants in existence before ensuring that the existing units have been utilised to their maximum multi-shift capacity through intensive operation.

In these days of shortage, scarcity and exorbitant prices of capital goods, we cannot afford to invest in additional units, till all the existing units produce the maximum possible output through three-shift working wherever possible. For example, from time to time, we get a scare about shortage of cloth resulting in an upward movement of prices. The only way to keep prices down is to permit plenty of flexibility to the operators of these units to go up to the maximum output and offer them facilities for achieving it.

Thus, in the broadest sense, the problem of raising productivity boils down to the most efficient utilisation of all the available resources and to produce as much wealth as possible at the lowest possible real cost.

Higher productivity has obvious benefits for every section of the community. It results in (i) larger supplies of consumer and capital goods at lower costs; (ii) higher real earnings for the worker; (iii) better yield and return on

capital employed by the *entrepreneur*; (iv) improvement in the general standard of living; and (v) larger employment opportunities in the long run, through establishment of export markets, as a result of production of goods at lower prices to withstand competition, internationally.

Who are the parties concerned in bringing about higher productivity? Obviously, the three parties are the employer, the worker and the government. Consequently, the extent to which efforts to achieve higher productivity can succeed, would largely depend upon the basic understanding between the three parties.

In discussing the problems confronting the employer in raising productivity, the triumvirate have each their own critical angle, and much will depend upon their convergence to reach the apex.

The employer's angle is: (i) higher output per man-hour; (ii) cheapening the cost of the product. The worker's angle is: (i) better wages with minimum additional work-load; (ii) immunity from retrenchment and unemployment.

Government's angle is: (i) social justice and welfare of the worker; (ii) equitable distribution of the additional profits between the worker, the employer and the consumer.

There is thus some apparent conflict of interest between the parties concerned, particularly between the employers and the workers, needing the conciliatory assistance of government at all stages. Most of the difficulties confronting improvement in productivity arise out of this triangular conflict of interests. Let us see how they emerge and in what shape they present themselves.

Higher productivity results from any or all of the following factors: (1) improved equipment (2) improved tech-

nique and (3) improved human effort.

The question is whether the worker can claim his share of contribution in respect of all the three factors, or only for the last one, viz., improved Human Effort. This question has been the principal hurdle in the way of all productivity drives. This is not a matter to be dealt with by means of legislation; it can be solved only by means of mutual understanding and cooperation. This brings us to the fundamental question of the need for ensuring good industrial relations at the National Level, the Industry Level and the Plant Level.

Policies decided at the national level would normally clear the path at the industry and the plant levels. Unfortunately, no decision at the national level is capable of effective implementation owing to inter-union rivalry. Similarly, at the industry level, some of the State laws give recognition to a union on an industry-wise basis, taking into consideration its representative character collectively in a particular industry. In practice, any programme of productivity acceptable to the industry-wise union, is not possible of implementation. Consequently, one has to fall back, in most cases, on a negotiated effort for raising productivity at the unit level only. There are difficulties even in a situation where the workers are willing to carry out a mutually agreed scheme of productivity.

There are variations in the pattern of obstacles in the path of an employer who wishes to initiate schemes for higher productivity. They vary from plant to plant; but the basic reason for failure is absence of cordial industrial relations, arising from one or more of the usual causes of such discord. The tragic part of the story lies in the fact that, while there are ample opportunities for workers to improve substantially their pay-packets through higher productivity, union politics come in the way of their reaching an agree-

ment directly with their employers. The same hurdle is often found in the way of schemes of Participation of Labour in Management. In an atmosphere of this kind, it is extremely difficult for employers to initiate the very first step of taking the workers into their confidence for launching schemes of productivity.

Let us assume for a moment that, in a particular unit, the above-mentioned difficulty is not there, and the industry-wise recognised union has a following in the unit or in the industry as a whole. In that case, the next question is the assessment as to what extent the increased productivity is due to improved equipment and technique, and how much of it is due to human effort. This is a universal problem; and at Geneva, I have heard of disputes over this point between employers and workers of other countries as well.

Although it is a highly controversial question, there is no doubt in my mind that, in any industrial unit, it is possible to ensure a substantial increase in productivity exclusively through installation of improved equipment and technique, *without any additional effort on the part of the worker*. In this age of automation, the machine-makers dare not put on the market any new piece of machinery which does not show some improved output or offer labour-saving features for fear of being ousted from the field by competitors. This is precisely the reason for obsolescence of equipment, which costs millions, in a process where mechanically perfect equipment is discarded to make room for modern and uptodate machinery.

In the rapidly advancing world of today, it is a question to ask what labour's share should be in a scheme of things where, through no effort on the part of the worker whatsoever, the output goes up through sheer replacement of equipment and introduction of modern technique. The answer is obvious;

but the worker refuses to agree that in such cases he is not entitled to any share in the benefits of increased output. In certain chemical industries, by sheer doubling the capacity, it is possible to double the output without any additional effort on the part of the worker. There are clear cases which prove the dictum that it is possible to increase productivity without any contribution of human effort.

The only claim of the worker would be a negative lien on the employment potential. In other words, if the old machinery were not replaced by modern machines, the employer, in order to produce the increased output, would have to enlarge and add to the equipment of the old type which would have created further employment workers. Even that stand is untenable. Just as much as a worker with a developed skill puts a higher price on his effort by demanding better wages, so can an employer claim the inherent right of equipping his unit with more modern machinery to earn better profits without interference from the worker.

However, there is an exception to the general rule. If the modern machine involves, because of its speed or complexity, greater alertness and attention or deft handling, it is a factor which has got to be compensated. The very fact that the employee has to undergo a special training to handle the new machine and give up and forget his acquired proficiency on the old machine, establishes some claim to a share in the increased profits. On the other hand, it can be argued by the employer that the advent of the modern machine would relieve fatigue caused by operating the old and antiquated machine.

The fairness and unfairness of such claims both on the part of the worker and the employer is a matter of conscience. *In any case, dictates of social justice demand that the benefit of doubt, if any, should go to the worker. if the*

role of the industry is to be, amongst other things, that of an agency for the social emancipation of working classes.

The case may now be considered, where there is definite evidence of a contribution on the part of the worker towards increased production through human effort: (a) partially due to new equipment and human effort; or (b) exclusively due to human effort with the existing machinery.

In both these cases, the quantum of the share of increased profit is the point at issue. This could be best decided through a process of collective bargaining, where such bargaining is possible with the backing of a representative union. Failing that, recourse to arbitration or adjudication becomes inevitable.

In the case of (a), due weightage should be given to the cost of machinery, its depreciation, the interest on capital, and the burden on the finances of the company. Often, the industrial tribunal, which deals with disputes over wages, ignores one or the other of these factors, and resulting decisions arrest the progress of industrial expansion, as every new venture must have a feature to save labour costs, particularly as the cost of equipment is now very high.

In the case of (b), where workers are solely responsible for increasing productivity through greater effort, the problem raises no serious difficulties, except for the additional expenditure involved in creating better working conditions than before. So long as due weightage is given to this item of expenditure, there is every justification for a fair deal to the worker in such schemes. *To grudge his fair share is to put the clock of productivity back and to chill the desire of the worker to cooperate with the management in future schemes of rationalisation.*

If the philosophy of higher productivity has not, so far, attained a desirable momentum in our country, it is mainly

due to the worker or the employer having failed to understand its ultimate benefit to the national economy, apart from the personal advantages which would accrue to both the worker and the employer. It is a pity that, in our country, efficiency engineers, who alone could assess the respective shares of the contributions of the worker and the employer in such schemes, are not available in sufficient numbers, and even where they are available, they are not in a position to command the confidence of the worker.

Perhaps, the National Productivity Council will, in course of time, find it possible to create a special cadre of professionals who, with their ability to assess the contributory causes leading to increased productivity, can act as impartial mediators between the employer and the employed.

Productivity and Rationalisation of Labour are inextricably connected, and it is here that most of the productivity schemes have bogged down. This is partly due to the fact that, in the early attempts at raising productivity, all emphasis was laid on rationalisation of labour which, in most cases, meant immediate retrenchment. However, our country is now wedded to the principle of "rationalisation without tears," which has taken the sting out of rationalisation. Unfortunately, even after securing immunity from retrenchment, the trade-unions have, in many cases, raised the bogey of fall in employment potential and insisted on maintaining the same number of jobs. In other words, they have denied the employers the opportunity of reducing the original complement of workers, by taking advantage of natural separation through death or superannuation, or by deployment. This unreasonable attitude on the part of some of our union leaders will, I am afraid, retard, beyond doubt, all schemes of productivity.

Whilst rationalisation of labour is

but one of the many ways of attaining higher productivity, it has an important bearing on the subject and it would be indulging in wishful thinking to hope that the scheme for raising productivity can ever be truly achieved by ignoring this important ingredient

Intensive operation of a unit, with deployment of surplus labour, with latitude to take advantage of natural separation, will more than take care of the fear of retrenchment and unemployment. A bold and imaginative policy can alone settle this age-old issue which has held up our progress in the path of productivity.

Despite such handicaps, employers have launched schemes to improve productivity by offering guarantees to the trade unions against retrenchment. In one of our soap factories, we introduced an incentive scheme in 1955 on a voluntary basis. We found that productivity went up by over 40 per cent and that the average basic earnings per worker have risen by 75%. The workers concerned are really very happy, as their present earnings are the highest in that region. It is interesting to note that, in this case, the workers themselves came forward and accepted the scheme. In the case of a cotton mill, where the representative trade union readily agreed to work 4 looms per weaver, instead of the conventional 2-looms, the increase in productivity per man-hour was 50 per cent, with a corresponding increase in earnings. These examples clearly go to prove that there is ample scope for increasing productivity, and that all concerned, including the consumer, stand to benefit by it.

Strange as it may seem, the aftermath of many a successful productivity drive has been a marked increase in absenteeism. It is indeed a paradox that, on the one hand, the theme song is the poor standard of wages in the country and yet, as soon as the worker's pay packet gets embellished through produc-

tivity schemes, he is inclined to work less number of days and prefers to rest at home or go to his native place. Consequently, there is no appreciable improvement in his annual earnings. It is a pity that, when conditions are created for a worker to improve his efficiency and earnings, he neutralises the advantage by mortgaging his potential earnings in exchange for a lethargic existence. The above remark is not an abstract generalisation, but a statement based on actual observations made in some of our plants.

In some of the studies dealing with schemes of productivity, there is a common tendency to focus all attention on the worker, and the employer takes it for granted that, on his part the efficiency does not need any improvement. This attitude on the part of the employer has often discouraged trade unions from enthusiastically responding to the call of the management to raise productivity.

There are many ways in which the management part can be overhauled to be geared in time for higher productivity. A few may be mentioned: (i) appointment of qualified persons to improve application by executive and supervisory staff of sound policies and efficiency techniques; (ii) improving the methods used for selection and placement of staff in the undertaking; (iii) introduction of the practice of giving brief induction courses to new supervisory staff; (iv) strengthening and energising the line of communication between the management on the one hand and the foreman and supervisor on the other; (v) appropriate training for supervisors designed to promote productivity consciousness amongst the operatives. TWI has proved of great value in many undertakings; and (vii) improved system of personnel management. If both

management and labour enter a project in a spirit of mutual assistance and prepare the grounds on the lines suggested above, some of the obstacles in the path can be overcome, without giving room to any grievance on either side.

To sum up, productivity drive is a war on waste in all forms. The movement has to be carried on by a combination of brain, brawn and bullion. The prosperity of a country is determined by its production, which, in turn, would largely depend on productivity. The ultimate aim is to cut costs and prices, in order to stimulate more consumption. This can be done only by increasing the output per unit of labour and time expended.

As said earlier, the productivity of an enterprise depends as much, if not more, on managerial planning, direction, control and organisation, as on the capabilities of the worker on the line. Looked at from this point of view, the concept of productivity becomes a measure of managerial efficiency. Thus, the efficiency of top management will be reflected in the productivity of the managed enterprise.

It has become widely recognised that rising productivity is essential for raising the standards of material prosperity. It is high time for under-developed countries, like ours, to take serious note of this basic requirement for improving the standard of living of the growing population. In the last analysis, the success of every effort to develop higher productivity would depend primarily on improved co-operation between the employer and the employed, and the joint endeavour of both to achieve the object in view. The shift of emphasis in labour-management relations should be in the direction of "collective thinking rather than conflicting bargaining."

Productivity Movement in India

The Labour Point of View

G RAMANUJAM*

INDIA is struggling hard to become an industrial nation. Intense efforts in this direction, however, began really only after Independence. We are therefore more than a century behind the industrial nations of the world; and it will be an extremely difficult job for us to catch up with these advanced countries, for their initial advantage is our initial handicap.

There is, however, another side of the picture. Our late start is not without its advantages. We have the benefit of the experience and knowledge gained by advanced countries during all these years so that our starting point may well be at an advanced stage. We may go through all the trial-and-error process which the United Kingdom and other countries have gone through. On balance however, the position is one of limitations, resulting partly from the late start, but largely from the peculiar circumstances obtaining in our own country. The problem of economic development is riddled with a number of difficulties which characterise the Indian economy.

India is still mainly an agricultural country with roughly eighty per cent of her population still depending on agriculture and allied rural industries. Therefore, when we try to follow the so-called advanced countries, we have to take note of the various limitations inherent in the nature of things. India has a

large surplus of manpower. Her unemployment figures are staggering. Underemployment is almost universal, except, of course, in the case of a fortunate few employed in urban organised industries and services. These problems are not there for the industrially advanced countries and therefore while attempting to absorb the knowledge and experience gained by such advanced countries, and to shape our economy on that basis, we should take care that such steps fit in with our own requirements and resources.

Considering the nature and volume of unemployment, it is really difficult to say whether in the near future there is any chance of our solving this problem effectively. Perhaps we have to pass through 3 or 4 Five Year Plans and even then we are not sure whether the problem can be tackled. Therefore, our problem is really completely different from the position as it obtains in the advanced countries of the world.

There is no question of Eastern wages and Eastern workloads or Western wages and Western workloads. It is Indian wages and Indian workloads under Indian conditions and circumstances. This attitude alone can lead to a solution of our problem. All of us, therefore, have to do a lot of introspection rather than to look to the East or the West.

There is another aspect of the matter. In the case of the advanced countries, it

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was possible for them to become advanced because of the huge export trade; more often, their industries were geared to more export trade. The advanced countries had a very big initial advantage in this direction. They were able to build up and maintain export trade by colonial expansion. But those days are gone. India can never hope to build up an empire or have colonies for herself, whether for political or trade purposes. On the other hand, modern trend of thought is towards political independence. If this is the growing tendency everywhere and if each country wants to become, as much as possible, self-supporting, the prospect of building up a large export trade or even maintaining it for any country is very dim. Monopolised export markets are no longer possible as a permanent source of strength to support the industrial economy of any country. Even advanced countries are compelled to reorient their foreign trade, importing raw materials or finished goods—more of the latter in course of time—in exchange for goods exported.

Should India try to build up her export trade and make such adjustments as may be necessary as to suit the requirements of export markets? In the first instance, with advanced countries having initial advantages in this respect and all countries trying to build up foreign markets, the prospect of our developing a permanent prosperous external market is severely limited.

Secondly, we must consider whether the import of goods in exchange from other countries will not affect the potential employment opportunities in our country, if there is a chance of our own country producing those goods here. The range and extent of the goods to be imported in exchange should be limited to those which we will not be able to produce here and such items naturally must be very small. Therefore the capacity to compete successfully in export mar-

kets should not be the main consideration in working our industries.

At the same time there is no doubt that we should make our industries run to their optimum efficiency. We have a huge population in our own country and the internal demand itself is quite big and bound to grow. Therefore, the object of the industry itself should be to depend mainly on the internal market. If we develop a healthy internal market of varied nature and adequate purchasing power, it will absorb the products of industry and leave room for increased productivity.

But what do we find in our country? With large scale unemployment we cannot expect the internal demand to grow. The efforts of the NPC in the direction of standardisation, reduction in the cost of production and general cheapening of goods, are commendable. But with the low purchasing power of the people on account of unemployment etc., the problem is an adequate off-take for the mass of goods, cheaply produced.

We introduce labour-saving machines to produce a larger quantity of goods at lower cost but it is not the machines that are going to consume the goods so produced. It is human-beings who have finally to consume these goods. If there continues to be unemployment, no matter however cheaply we may produce goods, they will not find a market, for the people will not be able to buy the goods; and the whole objective will be defeated.

Hence the main problems are: to provide employment for the millions; to distribute purchasing power among these millions and to stimulate their demand for goods. Then if we produce a larger quantum of goods at lower prices in response to the people's demand, the economy will have a sound basis and productivity will grow.

Our productivity plans and programmes should not ignore these basic as-

pects of the Indian economy. Productivity schemes therefore should not be designed in a manner that would reduce either the potential or existing volume of employment or result in the shrinkage of the purchasing power of the people. There is feeling among labour that productivity schemes turn out to be just one more lever to increase the workload of the workers and reduce the number of hands employed. May be, this is one way of increasing the per capita productivity of labour. But this way of increasing productivity leading directly to additional unemployment cannot do good to a country which has already a huge surplus of manpower. Also, it will be difficult to get labour's cooperation for the success of any such productivity schemes, if labour knows that ultimately the axe is going to be applied to it. It is, therefore, necessary to disabuse labour's mind of this fear.

We want to reduce the cost of production so as to have the maximum output for the resources put in the industry. In order to increase productivity, we use modern techniques, upto-date machinery, automation etc. Assuming one worker is thus enabled to do the job of 10 workers, what does it mean? It means that we are throwing out 9 workers, which in turn means that we are cutting off the purchasing power of 9 families. Then who will buy the goods if 9 out of every 10 originally employed are thrown out of jobs?

Productivity should not be built round dry economic theories; productivity should be built round human needs; the needs that arise in our country. If we start the productivity movement and go on bringing in more and more mechanisation by automation and thus displace labour, there is going to be more and more unemployment. Already we have got a large unemployment problem and the productivity movement would only increase this unemployment still further. Productivity schemes should not displace people who are already em-

ployed; our problem is to find employment for the millions and our schemes should not aim at dislodging people and creating further problems. That should be the basic approach.

We are on the one side saying that industry should be decentralised, that labour-intensive methods should be resorted to, otherwise we will not be able to provide employment to millions. On the other, we are having automation. It is argued that there should be a balance between labour intensive and labour saving mechanism. It is really difficult to draw a line. The first thing which is very important is full employment and any productivity scheme which would help us to take a step nearer to full employment should, therefore, be welcome. Labour has been accused in some cases of being opposed to productivity or rationalization methods. Labour approaches this problem in two ways. One is permanent reduction in the initial volume of employment. Supposing a factory today employs 1000 workers and by introducing modern techniques we are able to reduce the labour to 500, job opportunities for the remaining 500 are permanently cut off, unless we have the capacity to provide alternative employment for those 500 people.

The fact is that we have not the capacity, despite tripartite agreements, rationalisation without tears etc. There is a feeling in certain quarters that if we go on this way, continuously increasing productivity, we shall at some stage be able to solve the problem of unemployment; and examples of advanced countries are given in support of this contention; but our conditions are different. If we want to be immediately practical, we must enquire into the reasons for low productivity in our country. The main cause of low productivity is to be found in labour-management relations. Labour and capital are said to be partners in the process of production. If there is mutual trust and cooperation between these two partners, there will be better productivity; but if each looks upon the

other as an opponent and goes to court and resorts to law everyday, there is no basis for trust, goodwill and cooperation. If productivity is to go up, the foremost requirement is healthy industrial relations. That means three things: enlightened employers, responsible trade unions and minimum government interference.

It is essential that employers organisations should function in such a way that their representatives at the plant level readily implement agreed decisions taken at tripartite conferences. Indian employers must develop a sort of enlightened self-interest and organisational discipline, if we are to succeed in our Productivity Movement. There must be a mutuality of obligations. There cannot be a code of discipline for labour alone. Employers cannot be free from the same code of discipline. This was in fact agreed to at the Indian Labour Conference. Two years ago, it was laid down that parties should bind themselves to resolve all unresolved disputes by referring them to voluntary arbitration. But this has not so far been honoured at the plant level.

In recent years, there has been a great increase in litigation, with parties rushing up to the Supreme Court. Productivity cannot increase through litigation. This *litigation-mindedness must be given up*, if the cooperation of the working class is to be obtained for increasing productivity. Litigation has practically become a sort of secondary industry; and the dices are loaded against the workers, for while employers fight their case with funds drawn from industry, the workers have to pay their own expenses. Labour has got as much right as the employer to the general resources of industry. Industry must, therefore, be asked to pay for the cost of litigation both for the employers as also the workers. In fact such an obligation might be a deterrent to litigation, and this would be in the interest of productivity. Litigation must be stopped, and there must be compulsory resort to voluntary arbitration.

Some years ago, an ILO Productivity expert came to Coimbatore and delivered lectures on productivity. The workers expressed their fears and suspicions about improvement in productivity. It was just one more device to reduce employment and increase workload. If so, was not labour justified in opposing a movement so directly suicidal to their interest? The ILO expert on the other hand argued that far from increasing workloads, productivity techniques diminish them with simultaneous increase in wages. Hence the Productivity Movement does not adversely affect the interest of labour.

It should be clear that labour will not agree to its participation in the Productivity Movement, if it means displacement of labour. It will not agree to a heavier workload unless there is improvement in the conditions of labour. At present, the whole of industry is more profit-minded than productivity-minded. Labour is also a victim of the same attitude. The whole of industry has to become productivity minded in respect of its purchasing policies, the maintenance of machinery and other conditions. Labour is asked to take interest in productivity methods, but workers are treated as tokens or tickets, not as human beings. There has been no sharing with the workers of technical and financial knowledge.

There has been recently a move in the right direction: the workers' right to share in management has been finally recognised. But in practice this partnership does not appear to be working satisfactorily. If this partnership is to be real, there must be a sharing of technical and financial information. Irresponsibility in labour is due to the fact that they are kept ignorant. Labour participation in order to be real can only follow a psychological revolution in the minds of management. At present management is not prepared to sit down and discuss with labour on equal basis.

If such be the position, it becomes increasingly difficult to have an understanding cooperation of labour in the task of increasing productivity.

With the installation of modern, complicated, costly and delicate machines, it is essential in the interest of productivity to keep the workers informed and to train them continuously, by putting them through appropriate apprenticeship courses etc.

Further, accepted norms must be established; there must be in-plant training with productivity consciousness developed at the plant level. At every plant, there must be a productivity committee with representatives of management, workers, technologists etc., to discuss freely the basic problem of production and to suggest ways and means of

increasing productivity. The Regional and National Productivity Councils should only act as research bodies and consultants to assess the local and unit-wise committees.

Summing up, Productivity Movement for our country should concentrate on reducing the strain on the workers and at the same time enhancing their emoluments by allowing them to share in the gains arising from increased productivity. Better productivity can be ensured by better layout of the plant, by installing modern machinery, better maintenance, better quality of raw materials used, standardisation of the lines of production, rationalisation of overheads, better accounting, training of workers, supervisory and managerial staff, and last but not the least, better labour-management relations.

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A PRODUCTIVITY TECHNIQUE IN INDUSTRIAL DISCIPLINE

NPC understands from a Madurai firm that except for serious offences, it has, with the active concurrence of the workers' union, substituted an educative process for punitive measures normally imposed. The firm learnt by experience that punishment, instead of having the desired effect of correction, resulted, on the contrary, in wastage of otherwise productive time through observance of formalities etc. Hence, from 1 March 1960, experimentally for a period of 2 months, the firm has done away with the normal punitive procedure: no charge memo is issued; no explanation is called for; no enquiry is held; and, of course, it is not necessary to say that no punishment is meted out to an erring employee. For every noticeable lapse, an employee is called by the concerned manager who explains to him how it could have been avoided. Fault finding is avoided. Both the management and the union have widely publicised the scheme and expect that better discipline and higher efficiency will result from the operation of the scheme. NPC regards this as a happy sign and is confident that managements will find out and apply such productivity techniques on an increasing scale. Productivity is essentially such an attitude of mind.

Productivity and Project Planning

S S KHERA*

Productivity, put very simply, is the ratio of output to input. The questions we may attempt to formulate are of this kind: What are the points in time when input becomes committed? What are the decision-making points at which the input, which constitutes one side of this particular equation, becomes committed? What can be done, should be done, at these particular points of time and of decision?

Now, planning is a continuing process. It goes on from the very first conception of an enterprise, continuously, and indefinitely thereafter. In fact, that continuous process of planning is one of the marks of a healthy, and healthily-growing organisation. Nevertheless, indeed because of this feature of continuity of planning, it seems to be worth while to try and distinguish those points in planning at which the various things to be put in, whether it be in terms of money, or men, or materials, become committed.

In distinguishing those points at which commitments of input are made—and much of the planning process is itself a process of making input commitments—the purpose is to build into the project itself those factors which will make for the best productivity when the project comes into operation.

In doing so, and particularly, specifically in the context of our conditions and circumstances in India, we should draw from the experience that we have gained so far, such lessons as we can. A first group of these aspects consists of the given parameters within the coordinates of which any planning of a pro-

ject, and for that matter any planning or activity, economic, industrial, social, has to have its being. I would plead for the need to recognise, and to take into due reckoning, these parameters, too often omitted from attention, and at undue cost.

It would save frustrating, unnecessary controversy on what are or turn out subsequently to be very often points of little or no consequence; and that indeed it would help to concentrate due attention on those matters which are of real consequence in the planning of an enterprise.

What are some of these parameters? Firstly, there are the national, the major objectives. We argue a great deal about this; but within certain fairly clear limits, the major objectives of a particular nation, of a particular country, are more or less pretty well set. Indeed, they are the mark and measure of national cohesion and leadership. Secondly, there is the given parameter of our social and economic values. If I may give a trivial example, it is no use a manufacturer or his consultant saying "Biscuits made in India tend to go soggy; let us make them crisp as they should be, by using suet". Biscuits made with suet or lard simply will not sell in India; the social parameters say so. Thirdly, there is the prescription of a planned economy. Some people like a planned economy, some do not like it. But any planning of a project in India has to be in terms of planned economy and

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therefore, distasteful or disconcerting or trying as it may be, we have to abide by the particular features, including key controls, of our economy as planned.

Furthermore, there are the parameters of our country's geography and of our population, our historical past, the present, and the anticipation of the future. Then the political conjuncture, the tax pattern, the taxation modes, the methods and patterns and practices of our particular kinds of industrial groups and individuals have to be taken into consideration.

All these parameters deserve a little more attention than they sometimes get. Whoever deals with the planning of a particular project, and omits or fails to take due account of any of them tends inevitably to get the enterprise bogged down, involved in difficulties which might otherwise possibly be less; contrarywise, due reckoning of these things tends, I think, to increase the productivity of the project, for one thing simply by bringing it into being a little quicker than with the delays caused in resolving various unnecessary controversies.

A second group of aspects relevant to the building into the project of maximum productivity relates to the need to establish basic policies. These basic policies derive partly from the given parameters, specially relating to the project objectives. For instance, to take one objective of several: what is to be its policy as to profit? What are the pricing policies to be followed by the management? What are to be the production schedules of the project, in relation to the capacity, to the market demand, to the consumption pattern? Should the project be capital or labour intensive, and to what extent?

These are the kind of things that go to make up the second group; of matters regarding each one of which, be it a matter substantive or of method, it

seems necessary to lay down at planning points and stages, the basic objectives and policies to guide the management of the project. The productivity of the project will surely depend upon it.

Making up a third group, one factor is the need to make provision for expansion of the capacity to be established. If you put in capacity for expansion in your lay-out, or in a rolling mill, your stage one may be left holding a lot of expensive investment idle. If you buy or acquire a lot of land round about your factory in the expectation that you are going to expand, you are going to lock up your capital. It seems to me to be a proper part of the planning process to see where the balance lies. It involves the exercise of judgment. But, broadly drawing on our experience and our circumstances, there is scope, in our project planning, to make greater, and more consciously planned provision for the expansion of that project. I think this is a built-in element of productivity which when it is neglected makes it difficult, and certainly unnecessarily expensive in terms of time and money and cost of output.

Another is the problem of location. The decision as to where to locate a particular project necessarily has to be taken at the planning stage. But it is a decision which is often taken rather casually, sometimes even giving weight to circumstances which in the long run may prove somewhat irrelevant.

Then there is the problem of the pattern of production of the project being planned. I think, experience teaches us that there is scope for paying special attention to that: attention directed to setting out the modes and degrees of flexibility in the product specification and design and in the production schedules. In putting up your plant and machinery, it is necessary to establish a product pattern of a sufficient degree of flexibility particularly in terms of balancing the economics of the project,

running the project to due profit, and making full and proper use of the capacity established. These things are best done at the planning stages and at points where the input becomes committed.

One of our great needs in our country is to use the capacity installed. There is a great deal more capacity which can and should be more fully used: installed capacity which can and should be more productive. New capacity is most welcome; and in a rapidly expanding economy we need all of it. But it appears to be a reasonable hypothesis that unless it can be proved to the contrary, capacity installed and made full use of is the most productively used capacity, not only in terms of volume of product, but also in terms of the economics of the project and of the total social product which is derived from it. At some stage or other, the problem inevitably comes up before the management, before the proprietor, before the Government, as to the optimum capacity at which a particular piece of equipment, or a plant or factory, or a group of factories should be run. There seems to me to be much scope for applying the processes of scientific planning to these problems, to ensure the full use of capacity established, and to avoid waste through idle capacity or through capacity not fully used. I think it is a piece of building-in of productivity into the project to provide at the planning points for the full use of the capacity to be installed; for this purpose it is necessary to take into reckoning those features which I may call intra-project, but equally also the extra-project features, such as other similar or related projects, established or planned.

Then there is a vital matter, more directly related, and what is more recognisably a productivity feature in a project: namely, the choice of the processes, and the choice of equipment. We all know the way these questions arise

in specific cases. If you are to put in a new blast furnace, should you go in for a blast furnace using high top pressure, which has not been used before in our country? Should we use sintered ore to feed it knowing that we have not had the experience of sintering yet? Now these are decisions which have to be taken at the planning stage. One way of dealing with such problems would be to avoid them: surely a most expensive way of doing things. Managers and management groups need to discover and formulate the problems and the issues, by finding out what the possible alternatives are. Too often the alternative presented and upon which a decision is taken is a single alternative, which is none at all, or one of just two alternatives. With the increasing complexity of modern technology, it deserves very special attention at the planning stages to find out what is best for us at any particular stage of time. It certainly is an issue which is thrown up in almost every new major project which the Government sets up, and similar issues are thrown up in private enterprise too. In a country like ours, we have to strike a balance between not being left too far behind, in which case for one thing our product cannot compete with its final cost. Some processes are too experimental still, other processes are too out-of-date, some processes are obsolescent, some are at the stage of final proving. Where the final outcome of the experiment is likely to be known within a matter of months, certainly within the time when the orders for the equipment have to be placed, it is well worth taking a calculated risk. That was a kind of issue which was thrown up, for instance, in the case of the Nangal fertiliser project, particularly when decisions had to be taken as to whether the manufacture of heavy water according to certain processes which were then in an experimental stage should be committed to any particular process already established,

but perhaps more expensive and liable to become uncompetitive.

Another item is the need for somewhat greater attention at the planning stage of the plant, to arrangements for maintenance, replacements and spares. It is one thing to order spares if you are in the USSR or the UK or the USA or West Germany where you can pick up your telephone and put a call through to the suppliers and say our mill stand is broken, or a gear or bearing, or a burnt out motor has to be replaced, and it will be sent down to you by a truck in no time. We cannot do that here. Yet no project can afford stock-piling great quantities of spares and parts. There is need here for attention as part of the planning process and indeed as a rather difficult piece of technical planning, to provide for the necessary maintenance, spares, stores, tools and jigs. Of course much of this is obvious, even elementary; yet these things do go by default. And I do know that it is the managers, who are, and rightly, responsible and held answerable for breakdowns, delays in repairs and replacements, faulty maintenance, all of which affect vitally the productivity of a project. Managers should be encouraged and sustained with the necessary resources and arrangements, indeed called upon to establish maintenance, replacements and spare parts schedules adequate to the project at all times. For this purpose, they must be associated with in planning stages at every possible point of decision and commitment of input.

I may list very briefly here some of the items which tend to go by default in planning a project.

Staffing often tends to go by default during the planning stages. One is often too slow in the matter of staffing, of training and of research. Again and again one gets caught out on that.

There is then the question of estimates, as an element in the building of

productivity into the project in a number of ways. It would be a good thing to attend more fully to the question of estimates; for example, to provide that the estimates upon which the costs of the output and upon which our profit and loss depends, are accurate within reasonable, and reasonably defined limits, and adequately cover all the elements and constituent parts of the project. For instance, there may be an omission during the planning stages of a project of ancillary items and services which, while not forming part of the plant proper may yet be essential to get the project going at all. The project planner all too easily assumes for instance that power will be provided, or raw materials or water or some other services will be available and delivered at the plant in certain quantities and at certain rates, while the supply of these things is nowhere in sight. Or the estimates may omit to make provision, or sufficient provision for things like housing, or even, in some extreme cases, for things like training, or maintenance. Due foresight and attention in the planning of the project for all these things and for careful estimates of costs for providing them, are vital to the productivity of the project.

Over-estimating can be as bad, and sometimes indeed worse than under-estimating. There is an inevitable tendency to spend to the limit of the estimated costs; and extravagance or failure to establish the project at the cheapest cost possible is easier to conceal and more difficult to discover when there is an over-estimate than when there is an under-estimate. Since by its very definition the final cost will be somewhat different from the original estimate, it seems to be better to err slightly, but certainly not too much, towards an under-estimate.

It should hardly be necessary to stress the need to set out time schedules for the preparation and construction stages of a project. Indeed time sche-

dules are a normal feature of all project plans. But there is much room for greater observance of the principle that performance to the time schedule is of the essence of the project. The attitude to a time schedule is all too often somewhat like the attitude to standards of quality. Much greater attention in planning a project should be given to the formulation of the time-schedules, to ensure that they are practical, realistic and duly co-ordinated. One way, and a principal way, to ensure this is to devise the time schedules in careful consultation with those people, the managers, who are going to perform upon that time-schedule. Failure to do so tends to make time schedules slip, even break down altogether, with loss of time and money and affecting seriously the ratio between input and output of a project.

Finally, a word about the taking of risks: in any project planning, it is a futile effort to try and provide for every possible risk. There are margins of risk in deciding upon the project as a whole, the processes to be adopted, the equipment to be installed; there are production risks, and market and sales risks; there are risks related to the raw materials and services, and so on. If you are going to wait until you have hedged yourself completely and covered yourself for all the risks, you will certainly be playing extremely safe. That is a sure way of ensuring that the project will not attain its optimum productivity. The building into the project of the prospect of optimum productivity requires the building into the project also of carefully calculated risks: not just any risks, not the kinds of risks associated with gambling and speculation, for these things are even worse than playing too safe. It is an essential part of the sound planning of a project to calculate the risks, to evaluate them, and then to exercise a deliberate judgment to take those risks which are worthwhile or which in any case cannot be avoided. We are sometimes too frightened of

taking small risks; and sometimes this leads us to having to submit to a major risk later on.

Is it possible to build incentives to productivity into the project during the planning of a project? It is true that a good part of the incentives will be worked out during the operation of the project, and that these will be worked out by the employer and by the worker; nevertheless some incentives can be built into the project itself. For instance an attempt could be made to introduce patterns of payment by piece work, and associated with that, a pattern of production bonuses. This can, and should as far as possible be done as part of the planning of the project. This is a sound way of building productivity into the project. There is certainly more to be said for a system of production bonus rather than of profit bonus; I do not think that a profit bonus is the best way of increasing the productivity of an enterprise.

Workers' participation is essential if co-operative thinking is to replace conflictive bargaining. Workers' participation to my mind means the participation of all the workers in an enterprise in the management of that enterprise. It is more than, and indeed qualitatively different from, workers' co-operation or association in the working of the enterprise, and from works councils and the like. The way to ensure co-operative thinking is to ensure a common interest; and the way to ensure a common interest is to have at the management table and at the other management or decision-making points in an enterprise the participation of all the workers in the enterprise. This seems to me to be of vital importance to productivity. Now a few concrete suggestions may be made to enable the building into an enterprise the factors which make for the best return for the input, in terms of the output.

Firstly, I would suggest that the chief executive of a project should be

appointed at the earliest possible stage in the planning of the project. It is a too frequently made mistake, not to appoint a manager early enough. There is a tendency to think over much about the small expense involved on the salary of the manager for a few months; but the real cost is the loss to which you are put by delaying the appointment of the top executive. It might be worthwhile for the NPC to give some attention to this and perhaps to do some case studies on the appointment of the top executive.

Secondly, the top executive should be associated with the planning of the project itself. The project will be better planned for optimum productivity if the manager who is to run it is on the planning at every stage. It is wrong to say, as is all too often said, "wait until the plan is complete, or wait until the plant has been constructed, and then we will appoint a manager for it". Even though he cannot take the main planning decisions, he should be associated and involved in the planning from the first.

Thirdly, the top executive or manager should be inducted and involved in the principles of productivity and in sound productivity practices from the earliest planning stages. Those are the stages when you can build productivity into the enterprise; and that is when productivity consciousness is at least as essential as when the project is finally running. That is the way to start towards optimum productivity at the very heart of an enterprise. The top executive is the man on whom you are going to depend to make your project productive. I would suggest that the National Productivity Council might give some special attention to this particular need, namely, the involvement of the top executive in building productivity into the project.

Fourthly, we should do something more about inter-plant visits which are still going by default. The National Productivity Council should do something about it. To go and see things

elsewhere while you are planning a project is at least as important, if not more important, than going and seeing things when you are already committed to your process, committed to your plant and equipment, and committed to your organisation and your methods of work.

Finally, I would make a plea, particularly to the National Productivity Council, for special attention to human engineering as a feature in productivity. Human engineering is something rather new to all of us, the science of ergonomics, which deals with the relationship of the human body, the human mind and the human spirit with machines. This new scientific discipline is going to prove to be a feature above all others in making for productivity. More important still, it will help us all in the development of healthy relationships between man and man and between groups within the enterprise itself, and therefore in human relationships as a whole. This is particularly important in our Indian conditions. Frequently we use processes and machines developed in other countries, where the conditions are very different. It would help greatly at the planning stages of an enterprise to attend more fully to the relationships between the particular machines and our workers who have to work with them in our own conditions of climate, social habits, values, and practices. A great deal should be done at the planning stages and in the designing stages of the enterprise and of the plant and machinery to relate these to the local conditions in terms of human engineering. This would bear directly upon the productivity of the particular project. Here again it might be worth while carrying out some case studies of our experience.

To summarise, my suggestions are: appoint the chief executive quickly; associate him with the planning; involve him in the principles and practices of productivity; arrange for inter-plant visits and exchange of experience; and make a real start with human engineering.

The NPC

THE Second Annual Meeting of the NPC, attended by its members and representatives of LPCs was held on 25 April 1960. The President of NPC, Sri Manubhai Shah, made a general survey of the 2 years' work of NPC, since its birth as a society on 12 February 1958. The first year—1958-59—was really a preparatory period which the organisers of NPC utilised for establishing contacts and relationships with the various productivity organisations such as management institutions, research organisations associated with industry, technical bodies like the Institute of Production Engineers and academic institutions such as the Tata School of Social Sciences, the Indian Institute of Technology, Kharagpur, the Institute of Science, Bangalore and many other distinguished institutions. These contacts have proved very useful in the work of NPC which has however now begun to organise training programmes on its own, to which a reference is made later.

Organisationally, the NPC had first to concentrate its attention on creating a number of local productivity councils which could act as spearheads of the productivity drive. The President was happy to inform the Council that 36 LPCs had been established, practically covering all the industrial centres of the country, beside Statewise Councils covering Rajasthan, Assam, Andhra Pradesh, Kerala, Eastern UP and Rohilkhand. The membership which mainly comprises industrial units has already reached the figure of around 2,000. These LPCs have been fairly active in the organisation of productivity programmes as must have been evident from the last 4 issues of this Journal. The importance

of LPCs is being recognised by the NPC itself, as an amendment of its Constitution is under consideration in order to give larger representation to LPCs, as was suggested by Dr. Lokanathan at the last LPC Conference.

The volume of work done by NPC was factually summarised by the President: (i) nearly 70,000 copies of 15 publications, including this Journal, pamphlets and Reports of Productivity Teams; (ii) the setting up of a comprehensive library of productivity literature at Delhi and nucleus libraries at NPC regional centres at Bombay, Calcutta, Madras, Kanpur and Bangalore, with a project to set up such libraries under the auspices of LPCs; (iii) nearly 500 film shows alongside explanatory talks attended by nearly 25,000 persons; (iv) 62 seminars, conferences and symposia attended by nearly 5,000 persons, the subjects covered being work study, incentives, management practices, personnel management, human relations, workers' role in productivity, industrial psychology etc.; (v) 162 talks on productivity subjects attended by nearly 6,000 persons; (vi) over 1500 persons trained in various courses such as production planning and control, statistical quality control, stores reorganisation, inventory control, executive development, marketing management, materials handling etc. The target for 1960-62 is 300 training courses for at least 5,000 persons; (vii) stimulation through LPCs of inter-plant visits in circuits and in-country productivity teams. 18 teams and circuits, constituted by the LPCs have made a study of materials handling, human relations, industrial safety, plant layout, and particular industries such as

textiles, pharmaceuticals, light and heavy engineering and cycles.

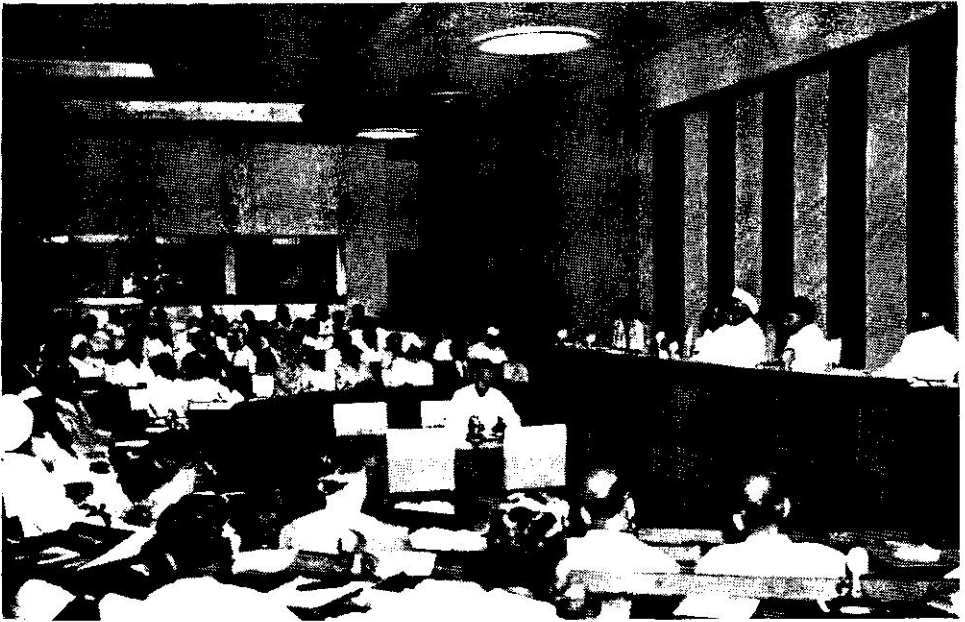
NPC has expanded its foreign programme. Under TCM aid, 8 productivity teams consisting of 82 persons have so far been sent to foreign countries including the USA, the UK, West Germany, Japan, Italy, France and Sweden. These teams have made a study of the following industries: plastics, coal mining, cotton textiles, road transport, management organisation and training, factory building layout and construction etc. 15 more teams will go out during 1960. They have already started making intensive studies of their subjects within the country in preparation of making studies abroad. 37 trainees were sent abroad in 1959 for training in industrial engineering, management and relations. An additional batch of 20 trainees has been sent to France for training in scientific management. 50 trainees are likely to be sent out during 1960 under TCM programme. All these trainees are selected from industries so that they may acquire the techniques which lead to higher productivity. Negotiations have been conducted for sending productivity teams and trainees to the Soviet Union and other East European countries. With the finalisation of these negotiations this programme will further expand.

It is rather awkward for the NPC to comment on its own work. In the afternoon,* however, the Home Minister of the Government of India, Sri Govind Ballabh Pant, inaugurating the NPC Productivity Conference, said *inter alia*: "... the National Productivity Council deserves to be congratulated for its achievements. It has hardly had a life of more than 2 years but during this short period it has made a substantial impression on the economic life of the country ... In two years you have done more than one could have expected and the progress that you have made so far

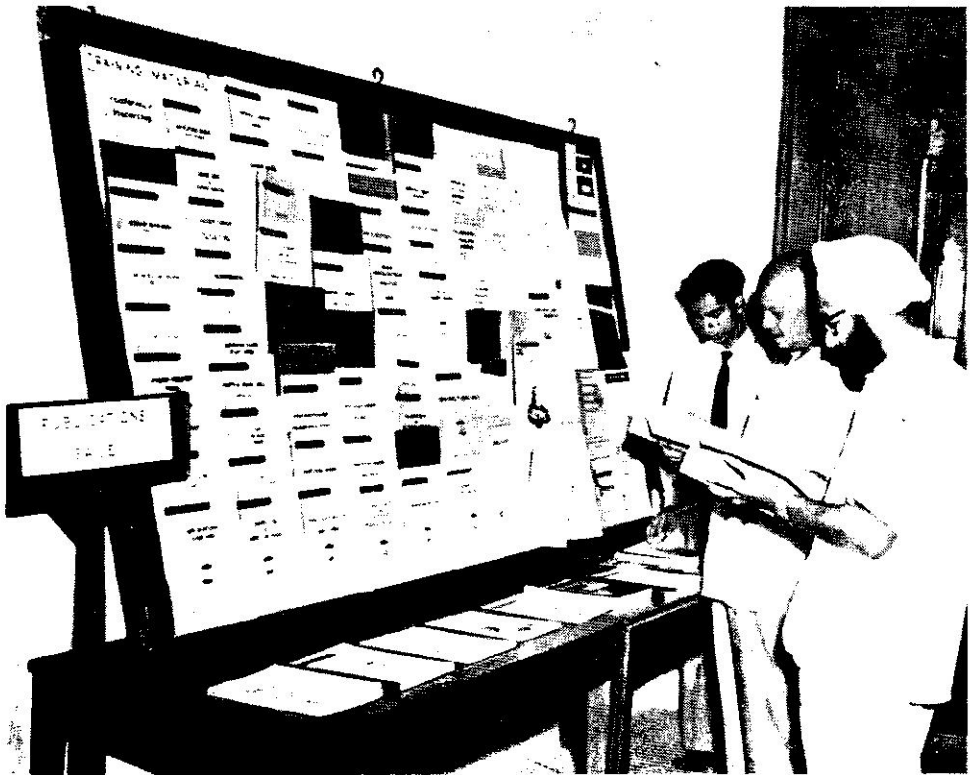
should hearten you for the future and I am certain that as time goes on, your achievements will become still more noteworthy I would like to appreciate the fine work that you have done so far..."

The NPC Conference on productivity which went on for the whole of the next day (26 April 1960) raised many lively issues, some of basic political and economic importance and revealed a degree of economic stratification, whose baneful effects, the Chairman (Dr. Lokanathan) said, would have to be overcome by NPC through its educational programmes. Dr. Lokanathan's concluding remarks pinpointed the issues raised at the Conference: "... the real question at issue is whether wages can or cannot be increased, unless further increase in productivity takes place. Workers in fact make a claim that they choose the managers and even the *entrepreneurs*. There is such a lot of philosophy in it.... In all these subjects, there is a gap between the points of view of the employers and the workers. We were painfully reminded of it when we heard today morning the distinguished representatives of employers and trade unions. Obviously the NPC has still a large educational job to do.... the speeches indicate that we have yet a long way to go... It is obvious that there are different points of view, specially on the question of sharing the gains of productivity.... There is need of a first rate seminar, where we can evolve some formula, acceptable to the bulk of employers and employees in our country.... The outstanding and happy impression created by this conference, however, is that everybody has emphasised the need for fuller utilisation of our scarce resources.... It is the non-utilisation or improper utilisation of resources that has created most of our troubles, just as in the case of irrigation on which we have spent Rs. 1200 crores in the First and Second Plans. The other important point that has been made at this Conference is regarding the growth

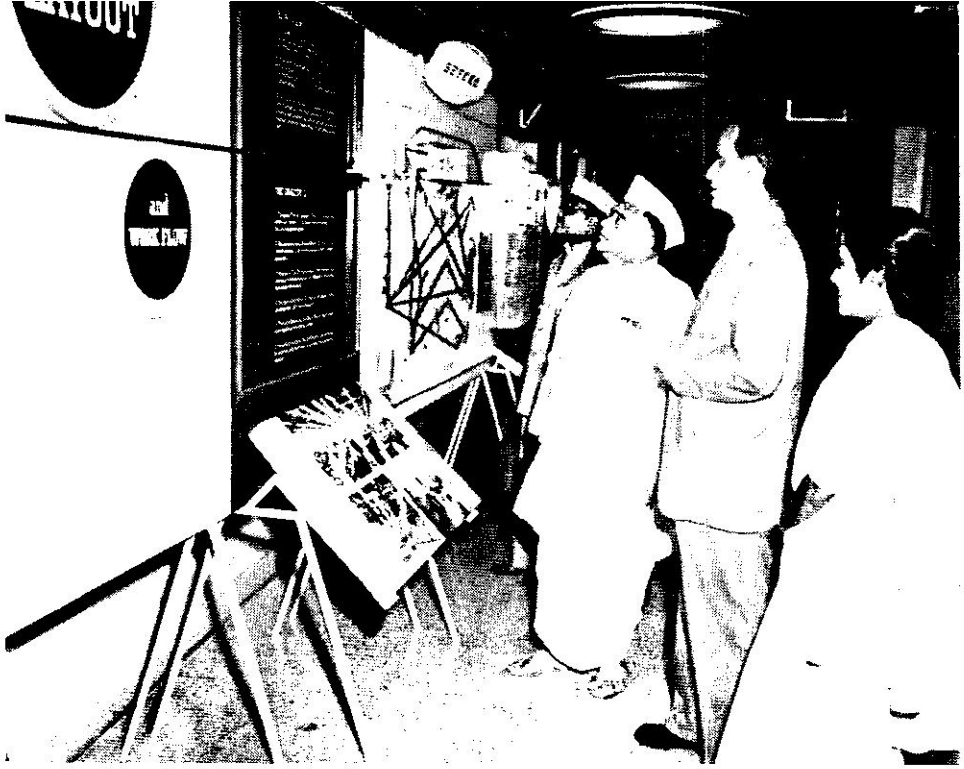
* Afternoon of 25 April.



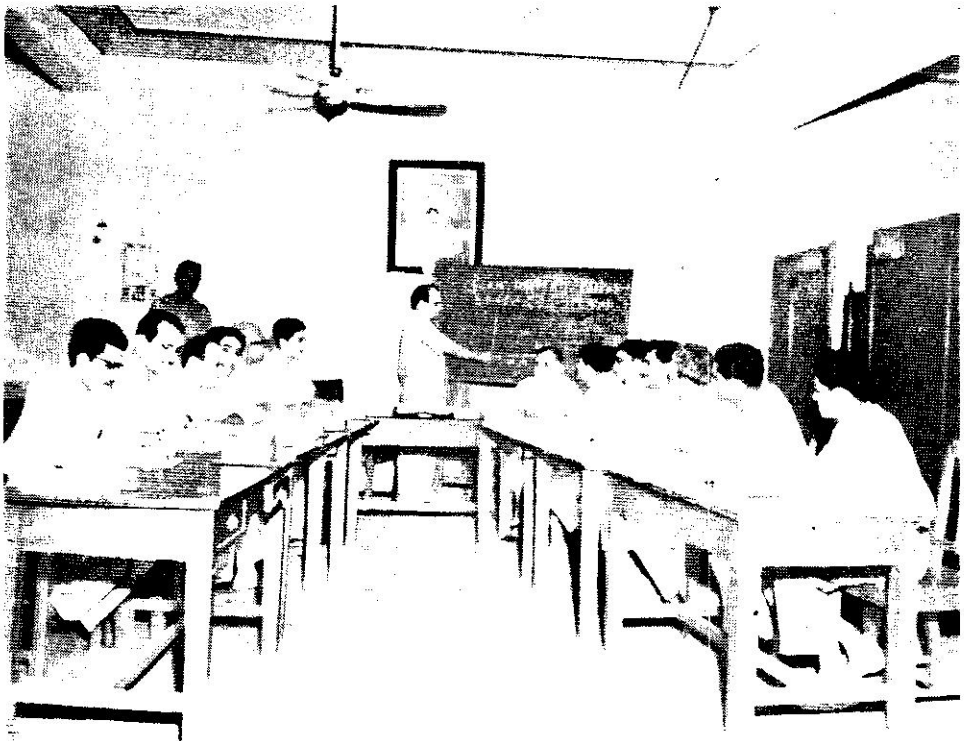
NPC Productivity Conference. Vigyan Bhavan, New Delhi, 25 April 1960]



NPC Publications on Display at the Productivity Conference



Plant Layout shown at the Productivity Conference



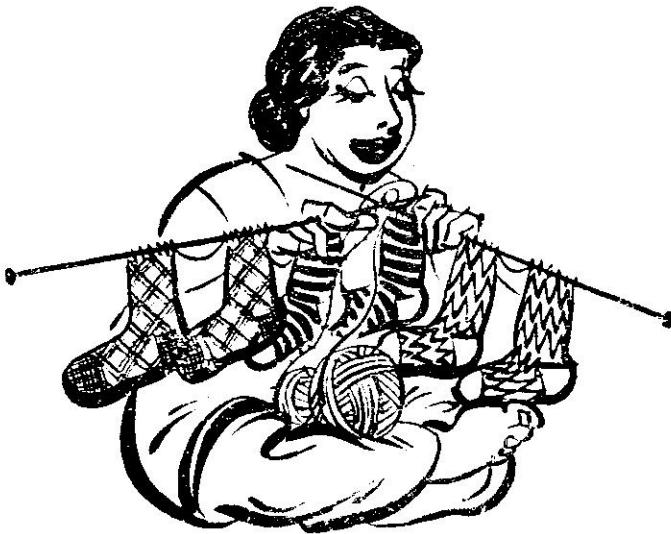
and development aspect; and many speakers have brought out this idea that we should build in our Plans the growth element, which is really to create further productivity and further expansion...."

Dr. Lokanathan particularly emphasised the human factor in productivity: "... I think, if I may say so, this is the one way by which we can resolve most of our difficulties: ... Every person has children and these children have to be educated; they must also have a house to live in. If the employers feel this way and look at it from this point of view, the sharing of the gains of productivity becomes easier, because whatever may be said, *there is a basic minimum which has got to be provided and it has to be provided from industry...* Low productivity is a reflection on the entire social and economic structure of the country. It is not merely the workers that are responsible; all the rest are equally responsible... The basic purpose of this Conference is to bring about this understanding of the importance of

the human factor. If it is recognised, the question of unemployment can never arise..."*

In this context it is worthwhile to mention that many distinguished industrialists and labour leaders participated in the NPC Conference on Productivity: Sarvashri Naval H Tata (Productivity in Indian Industry and Problems Confronting Employers), G. Ramanujam. (Low Productivity: Reasons and Remedies), SS Khera (Productivity and Project Planning), Babubhai Chinai (Factors of Productivity) HKS Lindsay (Productivity through Management's Eyes), YA Fazalbhoy (Management's Role in Productivity), JM Shrinagesh (Morale and Motivation) and GD Somani (Wages and Productivity). Three of the papers read by Sarvashri Khera, Naval Tata and Ramanujam have been reproduced in this issue of the Journal, and in our opinion, merit serious perusal, for they pose fundamental problems.

* See page 300 in the leading article.



Production Planning

Good Industrial Relations

ELLIS O KELLER*

SMOOTH industrial relations are the by-products of good leadership, and the supervisor's role is an extremely important one. Because so many of us tend to consider the problem of good industrial relations as separate and apart from the whole job of good management, it seems appropriate at the outset to touch upon the meaning of the term, "good industrial relations." To illustrate exactly what I mean, let me relate an incident: A friend of mine was asked to recommend an industrial relations manager to the head of a rather well-known company. After describing the qualifications of the man desired, the president summed it all up by saying, "What we want is a man who can guarantee us that we will not have labour trouble."

For almost thirty years this executive had been concerned about the marketing, production and financial success of his business. Now for the first time he was concerned over the prospects of labour trouble. The normal problems of the business, and the "labour situation" were two separate problems in his mind; virtually in two separate worlds. To do something that might promote good labour relations was of interest to him only to the extent that it was necessary to prevent interruption of production. What he wanted was someone to take over the responsibility for labour relations so that he could divest himself of the problem, and go about his normal and regular job of running the business. Needless to say, my friend was unable to recommend a man who could meet such requirements.

Good industrial relations and good management are one and the same thing. There is no function, no activity in industry which we can lay hold of and say definitely, "This is the personnel function." There is no programme or programmes of activities which we can superimpose upon an employee body, and say: "These are industrial relations programmes."

Industrial relations are good or bad according to how well each activity in the whole business operates. Good relationships are an integral part of each job from president to gang foreman; from chief engineer to office boy. In brief, good industrial relations are the result, not of the new things we do, but of the *way* we do all of the things we are already doing. Good industrial relations are the result of the *way* we set up our wage structure; the *way* we relate production decline to lay-offs; the *way* we handle cases of discipline; and the *way* we grant raises, and make promotions or demotions.

Nor does the answer to good industrial relations lie solely in these matters. It goes deeper into the basic operations of the business. It involves, for example, the care we take to see that one shift leaves things in proper order so that the next shift does not lose time in getting started. It reaches into the tool room where workers may be forced to use wornout tools because the tool-room clerk slipped in keeping his stock properly replaced.

Factors in Good Relations: It depends on how seriously we try to forecast our

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production requirements so that sharp changes may be avoided wherever possible. It depends upon how much interest we develop in our employees to serve our real boss, the customer. It depends on how good a sale job we do to bring in new customers without which there would be no employment. It also depends on how stable a financial basis we maintain for a financial enterprise. All of these things, and many more contribute to good or bad industrial relations. The way the whole business is run determines the answer. Good management and good industrial relations are inseparable. They are one and the same thing.

If we accept this basic concept it becomes obvious that proper policy and practice must be an integral part of the whole programme. This becomes a matter of leadership. It is the way foremen treat workers in relation to all these matters; the way the superintendent treats the foremen; and finally, the way a general manager or a president handles his own staff in order that right attitudes and right methods may exist toward the entire organisation. There is no activity nor individual in the business who is not affected if we are to manage so that good industrial relations result. Perhaps you feel that the implications I have outlined are too broad. I think part of our difficulty lies in the consideration of industrial relations which are too narrow. As we examine the way we manage, I am sure we will all agree that the starting point is a scrutiny of our policies.

Causes of Dissatisfaction: In order to establish a common basis of understanding I would like to define a policy as a principle or fundamental intention on which we base our plans of action. Certainly, the principles and fundamental intentions of management underlie everything we do so that there is no other basic point from which to begin. I submit to you, further, that dissatisfaction in the working forces occurs generally under one or both of two conditions: (1) When our policies are not right

in terms of modern, contemporary standards, or (2) When the leadership within the company is less effective in administering these policies to the workers than outside forces are in selling contrary policies to them.

This may appear at first thought to be a simplification of a major complex problem, but as we think over everything we do in this field, it soon becomes clear that there is scarcely any other answer. We have labour dissatisfaction either when our policies are wrong, or when they are poorly or weakly administered. Policy making and policy administration are major functions of management, and as we gradually perfect our management technique we hope to progress toward a better solution of our industrial relations problems.

Policies—The Extremes: Let us consider, therefore, this subject of getting our policies right. This is a far reaching question, so I suggest that we consider it from a broad basis. At one extremity there are such instances as sub-prevailing wage rates (either for the industry, or for the area); unsafe practices; favouritism; nepotism; lack of proper sanitary and hygienic facilities; disregard of personal welfare of employees; disadvantageous regulations; class, racial, or religious discriminations; and paternalistic or die-hard tendencies. There are others, but these are typical.

Most of these practices are no longer condoned in the average American industry. Yet, this observation holds true only for the present. As recently as forty years ago they were all generally accepted in some industries without much question. There is no "fixed" standard for "right" policies. Standards change from generation to generation. So we class outmoded policies under the heading of exploitation—and properly so.

Abolish Out-Moded Policies: Needless to say, if any of us are allowing any of these things to continue in our com-

panies, we are not just out of tune with the times; we are acting in our own worst interests. It appears to be the practice of some managements to permit an admittedly outmoded policy to remain in effect until the representatives of their employees demand a change at the bargaining table. A poor policy is retained as something to be used as a bartering medium. Would these same gentlemen permit an unsound, or unsafe practice in their homes until such time as their children grow old enough or become intelligent enough to protest? The answer is obvious.

At the other extremity is a policy of weakness. We can get too soft just as easily, as, in some instances, we have been too hard. When management surrenders those prerogatives which, by their very nature, belong to the management alone, we can call this "weakness." We can be weak in other ways. We can become frightened when crises arise, and raise wages too freely, agree to benefits, start precedents which are not for the best long-term interests of the enterprise itself, or we can be afraid to do sensible, constructive things lest someone will get a false impression. Ultimately, management, employees, stockholders, customers, and public-in-general suffer. Therefore, between being too hard on the one hand, and too soft on the other, we face the necessity of defining right policy down a sound course between these two extremes. Just what this sound course should be becomes clear as we understand fully the unsoundness of extremes.

Policies—Sound, Firm, and Open: Therefore, we turn to the centre road, and to what can be termed "the tenets of industrial capitalism." Broadly—and very broadly—I suggest that industrial capitalism means four things.

1. The purpose of business through the proceeds of profitable enterprise is to provide an ever higher standard of living for the people of the country.

2. Management must give better products at lower costs in order that

the greatest number of people may enjoy their use.

3. Each individual has a right to a standard of living commensurate with the contribution he makes to the standard of all.

4. Management must see that its policies and practices give each individual the opportunity to achieve his rightful standard. It is not possible to cite the specific policies which belong in this centre of the road. However, it is not an impossible task to determine what are good, acceptable, contemporary policies.

So, it is possible, as possible as anything can be in this vast, moving area, to bring our policies into alignment, and to keep them where our position is sound and defensible in terms of contemporary standards. Needless to say, unless our policies are right, and our position entirely defensible, there is not much we can do to achieve good industrial relations.

One last note on policies. It was, at one time, the practice of some companies to have three sets of policies, or rather policies divided into three categories: 1. Those that were shown to all employees. 2. Those that were given only to the supervisory force. 3. Those that were known only by top administrators and executives.

A company is usually kidding only itself when it thinks such matters can be kept "hush-hush." Sooner or later such a practice will end in embarrassment for management. Better have all policies open and above board so that you cannot be accused of sitting in the game with something up your sleeve.

Once we have our policies right we turn to the other condition under which employee dissatisfaction can occur; that is, when the leadership within the company is less effective in administering these policies to the employees than leadership outside the company is in selling them contrary points of view. This leadership within the company is expres-

sed in the way we live our day to day operations, and not in the doing of superficial things such as the distribution of pamphlets, the use of payroll enclosures, or the organisation of a baseball league. It is basically again the way we carry on. Let us turn to one or two common problems, and examine the manner in which they are treated. They will serve, perhaps, to illustrate our point as it should be applied to all operations.

Bases of Pay: Let us take one of the toughest ones first—the matter of wages. We will assume that we have met the first requisite—that our policy is right. We have made certain that our wage levels and wage systems are right in terms of good contemporary standards; but how is the wage system to be installed? When the jobs are being evaluated, do the workers know the reasons for the evaluation? By “reasons” I mean something broader, more fundamental than the erroneous opinion that the company wants to step up production and cut rates. After each job’s base rate is set in relation to those of the other jobs, are the workers concerned allowed to see the job study sheets, and become convinced that their jobs have been fairly evaluated? Will the job be re-studied if the worker feels strongly that all the facts have not been considered?

Does he know that his rate is in line with the rates paid for similar work in the community, and with those in competitive industries? These points are raised because we have the choice of getting acceptance of wage rates at their inception, or of going through long and costly procedures to get acceptance of them after trouble arises. We might call this process “management by consultation rather than by dictation.” It is simply the common sense procedure of “talking out” a problem together rather than “shoving it down employees’ throats,” and it isn’t a new procedure at all. Farsighted leaders have used this procedure ever since history began.

The unfortunate part of it all is that this method has been used only in spots

according to the temperament of the particular executive or supervisor. Our need, now, is to recognize it officially, and make it universally applicable. For years many managements have consulted with representatives of employees on matters of mutual interest through formal plans for such consultation. Today, this procedure in an organized form, is the law of the land. If this is the accepted procedure on a formally organized basis where intimate understandings of individual problems are difficult to achieve, isn’t it common sense to make this consultation effective between a foreman and his men where a completely intimate understanding of the problem may be had?

Changes in Employees’ Status: Now let us examine briefly some common occurrences in normal business life, the matter of raises and promotions, and on the other hand, lay-offs and demotions. Again there is nothing new in these everyday occurrences, but the way in which they are done may mean the difference between loyalty and disloyalty, between peace and strife. You are thinking that the seniority clause has eliminated all other factors, but in almost every labour agreement, even a seniority clause is based upon the phrase, “ability to do the job.”

Most of you are familiar with the following typical situations: 1. An employee is given a raise or promotion. Another employee comes in afterward, and claims to be as good or better than the one who received the benefit. His story is so convincing that we find it impossible to give him any real comparison between himself and the other man. Of course we send him out with “no” for an answer, but, the chances are, with a feeling of discrimination deeply imbedded in his mind. 2. An employee with a number of years’ service is picked for lay-off. When he is notified he asks why it took us five years to find out he was incompetent. Why did we not tell him three years before that he was slipping so that he could have improved his per-

formance? What answer can we give him that is sound, legitimate, and fair? 3. An employee of six months' experience goes home one evening, and while at the supper table his wife asks him, "Jim how are you getting on with your work?" He replies, "I don't know. Nobody ever tells me."

Do you like to know how you are getting on in your job? Do you ever tell your subordinates how they are getting on with their jobs? And can you do it in such a way that they will respect you for it?

Merit Rating: A definite plan, by which ability to do the job may be determined, seems the only sensible answer. This means a comprehensive plan of merit rating where employees are evaluated, insofar as is humanly possible, on a factual basis, and not subjectively according to a supervisor's opinion or possible prejudice. Even this is not enough. The way the rating plan is introduced and the way it is used are equally important. Obviously, the supervisors using the plan should have a hand in devising it, and it is equally obvious that the workers should understand the various factors on the scale. They might even have some valuable suggestions to make. These points are so simple and commonplace that it seems virtually a reflection on the intelligence of any group to mention them, but by actual fact how many foremen do take part in devising the merit rating plan they are to use, and how many do take the trouble to explain patiently to their workers the bases upon which their success or failure are being judged?

Perhaps the best answer to this latter question may be derived from another question, how well do you and I do it? How many of us have sat down with our immediate subordinates, singly or in groups, and discussed (not to mention worked out together) the factors on which they were being judged along with the relative importance attached to each factor. Thus, while it is a simple

common sense procedure, it does represent an accomplishment of the first magnitude to get it operating with all our supervisory forces.

The trouble with most rating plans, and I speak from experience, is that they are largely theoretical. The factors on the scale are often those developed by persons other than those actually on the job. All too often the ratings, once made, are filed away for safe keeping, and employees come to regard the entire rating process as a "black book" containing all of their misdeeds or errors. Unless the ratings are shown and discussed calmly and constructively with each individual employee by his supervisor, the whole process will cause far more damage to sound industrial relations than any good it will ever accomplish.

What could be more constructive than a frank, friendly discussion between a man and his boss as to the ratings made? There is no mystery to this, and if we will but apply the procedure to ourselves, we will know at once how our employees feel about it. Unless our rating plan plays a basic part in raises, promotions, lay-offs, and demotions, why have it?

With a well-ordered plan of merit rating, changes in work status are made under a system that everyone understands, and are no longer the real or alleged causes of discrimination growing out of what the workers believe to be the personal feelings of the foreman.

The higher supervisor may use the ratings made out by his subordinate supervisors to very good effect. He can quickly determine which supervisors are tough or lenient, too strict or too weak in their dealings with their workers. In fact, if I had my choice of judging supervisors by my own rating sheets on their own workers, I would take the latter method every time.

Influence in a Worker's Life: Throughout this discussion we have em-

phasized the responsibility of the supervisor in administering our sound policies in the way which builds understanding and promotes effectiveness. Who else is there in our industrial organizations who is in a position to command workers' confidence and respect so that they may feel the company's policies are right, and that they are receiving a square deal? Who else is in a position to help an employee make up his mind about the fairness of his wage rate, the necessity for orderly work arrangements, the value of intelligent and properly paid executives, the importance of the customer, the importance of good public relations and even the necessity for profit in the free enterprise system?

This being the case, it would seem illogical to indict any worker for showing disloyalty to his company, or for going astray in his thinking. The simple facts are that he has had no other basis for judgment; and if any indictment is to be made we must indict the only source that is available to give the worker sound counsel, the designated representative of the employer, the supervisor.

Supervisors' Training: This brings us to our final point which is the key to the whole situation. As we consider the supervisors and their capacity to do this job properly, we recognize immediately that many of them are incapable of explaining and administering the policies of the company. Except for the details of their own limited operations, they know very little about the company. Remember, "nobody ever tells them." Therefore, the crux of our problem lies in training and influencing the supervisors.

Many procedures have been devised in the past few decades to accomplish this objective. One method, if it can be called a method of developing supervisors, is to let them flounder around as best they can. Another way is to put them in classes and have them study matters of general information. Still

a third is through the medium of having them meet as a group in conferences, having them think out together some of their problems. While certain of these devices are of some benefit, they are but a step along the way, and are totally inadequate to accomplish the real purpose.

One major weakness of all these training procedures is the fact that the superintendents and higher ranking supervisors are left out of the picture, or are either unsympathetic or uninformed as to what their supervisors are trying to do, or what is being tried for them. Another weakness is that supervisors are usually among the last to be informed of the various policies, and changes in policies of the company. They frequently receive their first information on such matters from the union stewards or agents. Their own problems are sometimes unknown or ignored, and gradually there comes upon them the feeling that they are not of management, but separate and apart from it. They reach the point where they discredit the idea that they represent management to their workers. At this point they are ripe for organization into a Foremen's Union.

The thing that is lacking is real leadership. The supervisors cannot give it to their workers if they do not receive it from their own supervisors. There is required in well-managed industries a downward flow throughout all organization levels consisting of authority stemming from a combination of responsibility for administration of established policy, and from the exercise of judgement and leadership in the existing situation. And there is required an upward flow consisting of those questions, facts, and opinions arising out of actual experiences, and permitted to exert proper pressure on policy formation. If there are bottlenecks in this two-way flow they seldom will occur solely between the first-line supervisors and their workers. So, if we expect our supervisors to apply the principles of the foun-

dations for good industrial relations we must apply these same principles in the relations between higher representatives and those supervisors. The whole spirit and method of management to be practiced by the supervisor must initiate with the president of the company.

Right Executive Leadership: We return, therefore, to the realization that interpretation and administration of company policies with respect to industrial relations is not different from the way policies are made effective with respect to all other phases of the business. The problem is not one of working with the supervisors alone, but of finding some method by which unity of understanding, up and down, through all levels of supervision from president to gangboss, may be achieved. This is the problem of management, not only in matters of employer-employee relations, but in matters of cost, quality, and customer service. It is the problem of leadership. Just as we decided we could not indict a worker, but must indict the leadership offered him; so we cannot indict the supervisor, but must indict the leadership offered him; so we cannot indict the supervisor, but must indict the superintendent, general manager, and so on up the line if proper leadership is lacking.

Therefore, if we get our thinking straight to the point where we actually want to do something about this matter of good management, and not merely

talk about it, those in executive and leadership positions must accept the strong obligations which are inherent in these positions. This means we are obligated to take the initiative, and to start practising what we preach on our own jobs. This is the most far-reaching training job we can ever perform. Everyone looks to his boss for guidance. On any other basis, all talk about good industrial relations is just that—talk. Unless supervisors receive from their superintendents the same spirit and method of management they are expected to pursue with their workers, they will do the jobs with their tongues in their cheeks.

In conclusion, therefore, the answer to industrial relations problems is the answer to all other problems of business—good leadership. Problems of labour relations are not automatically solved by the signing of labour agreements. Consistent practices and good management from the top down, through every level of supervision, is the only sure and permanent answer. The obligation upon those in top leadership positions, first, to determine right policies, then to administer them in the way that builds understanding and releases initiative and creative effort, is a tremendous one. It is the greatest and most intriguing challenge in life. As we rise to meet it I believe we may achieve standards of accomplishment hitherto considered unattainable.

* * *

PRODUCTIVITY CULTURE

The foreman's and the administrator's emphasis upon punctuality, responsibility, and the desire and drive to get ahead in life is part of their culture. They have learned all these traits. Not one of them has been inherited—through the foreman's or the vice-president's family, or his race or his nationality. All these traits of the good worker, or good administrator, have had to be learned through training, family pressure, work opportunities, and through encouragement and reward on the job. To the foreman or the vice-president these traits and habits of his seem so integral to his behavior, so much a part of him, that he regards these virtues as entirely his individual achievement.

Productivity

Its Concept and Measurement¹

K S Sangha²

ALTHOUGH the term 'Productivity' has come into wide use only in recent times, it has been tacitly discussed and even elaborated since the beginning of modern economic thought. In fact, productivity may reasonably be presumed as the core of classical economics: the classical economists practically did not feel concerned about the problem of distribution. The predecessors of the classical economists—the French physiocrats of the early 18th century had a clear though probably lopsided idea of productivity. They however associated the "produit net" only with land. They held the view that agriculture alone was capable of producing a surplus or net product. On the other hand, commerce, transportation and even manufacture, despite the application of labour were not capable of producing a surplus and were therefore 'sterile'. The classical economists beginning with Adam Smith swept away this distinction between agriculture and other productive elements. In fact, the theory of productivity was substantially pushed forward by Adam Smith in

his *Wealth of Nations* (1776) in which he advanced the view that higher productivity rested on the principle of division of labour. Using the famous pin-making industry as an example, Adam Smith explained the advantages of division of labour in terms of greater dexterity of the workmen, the saving of time commonly lost in shifting from one task to another, and the stimulation of invention of machinery which enabled one man to do the work of many.

By the middle of the 19th century, the Industrial Revolution in England was almost complete; and Karl Marx, who drew heavily upon the theories of classical economists, particularly Ricardo, and upon what he saw of the industrial transformation in Great Britain, underlined the massive increases in productivity as the principal phenomenon of historical importance. He observed in *The Poverty of Philosophy*: "In 1770 the population of the United Kingdom ... was fifteen million and the production population three million. The scientific power of production would about equal a population of twelve more million, making a total of 15 million of productive force. Thus the production power was to the population as 1 is to 1, and the scientific power was to manual labour as 4 is to 1... In 1840, the population did not exceed 30 million; the production population was six million, while the scientific power amounted to 650 million, that is to say, it was

1. In Vol. 1, No. 3 of this journal, it was indicated in the leading article (page 1) that a series of articles on The Concept and Measurement of Productivity would be published in this Journal. The first article in this series was published in Vol. 1, No. 4, page 236.

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to the whole population as 21 to 1, and to manual power as 108 to 1. In English society the day of labour had thus acquired in 70 years a surplus of 2,700 per cent of productivity,³ that is to say that in 1840 it produced 27 times as much as in 1770."

Since the turn of the present century, economists began to realise the importance of productivity data like national income statistics as an aid to an understanding of the performance of an economy. It was, however, not until the Great Depression of the Thirties that the economists and statisticians took the pains to collect, analyse and interpret data on productivity. The USA was probably the first to compute productivity indices on a fairly wide scale, as comprehensive statistics for a large section of industries were available in that country. The US Bureau of Labour Statistics has a Productivity Division exclusively engaged in the analysis of productivity in various sectors of the economy.

The experience of World War I greatly increased the interest in productivity studies because it was conclusively proved that the major cause of the victory of the allies was due to the enormous productivity of the US economic system. This was even more so in World War II, but the fact had not yet been clearly understood or appreciated. The facts, however, of World War II made it very conclusive that the strength of a country lay essentially in its productivity.

When the war ended and the European economy was in a state of collapse, the Organisation for European Economic Recovery (OEEC) devoted much of its attention to the development and measurement of productivity.⁴ In the United Kingdom also, war time collaboration was continued in the Anglo-

American Council on Productivity which later gave place to the British Productivity Council.⁵ This Council has done substantial work on Productivity. Japan has also established the Japan Productivity Centre⁶ which is making herculean efforts to develop the productivity of the Japanese economy and has published literature on its theory and measurement. In India also the creation of the National Productivity Council in 1958 marked a signal step forward in the enhancement of industrial productivity which is bound to be a factor of crucial importance in the economic development of India. There is a proposal to establish an Asian Productivity Organisation. Internationally, the United Nations, and the ILO particularly, have been taking interest in the promotion of Productivity in a number of ways and in various parts of the world. Productivity has thus become the centre of the piece in the development particularly of underdeveloped countries.

The essential idea of productivity is simple enough. In common parlance, productivity is usually defined as the ratio between output and input both measured in real terms. If a factory works the same number of hours, other things remaining the same, but turns out 120 units a day instead of 100, productivity has increased by 20%. Industrial productivity is thus the measure of production per man per hour. Increasing productivity means that production becomes more efficient, or what is the same thing, less costly.

Output can be measured either in term of the physical volume of production or in terms of the rupee value of production. If a commodity or service, as for example, a bushel of wheat or a kilowatt of electricity does not, over time, undergo significant changes in its

3. Italics ours.

4. See article on European Productivity Agency, which appeared in this Journal, Vol. 1, No. 3, page 33.

5. See article on British Productivity Council, Vol. 1, No. 1, page 43.

6. See article on Productivity Movement in Japan, Vol. 1, No. 4, page 206.

characteristics, the physical volume of production would be a broadly valid measure. In case of such commodities, as for example automobiles, tractors, radio sets, whose characteristics go on changing over time, it is usually necessary to measure their output in terms of rupee value; hence adjustment has to be made for changes in the price level.

A given output (product) is the result of combination of many different factors of input, such as raw materials, machines, power, worker time and entrepreneurship. Since a unit of input might be one worker, one hour of labour time, one machine, one acre of land, one ton of raw materials or one kilowatt of electric power, it has generally been considered desirable to choose one yardstick of input which is present in all production. For this reason the input factor most frequently used in productivity studies is a man-hour of working time, popularly known as "labour productivity." This yardstick has an added advantage that statistical records on employment are usually more comprehensive and adequate than for any other type of input. At the present time, data for other types of input are not available in any comprehensive and consistent form. Furthermore, it is universally recognised that the standard of living of a nation is limited ultimately by the income created per hour of work, when account is taken of the ratio of the labour force to the total population, and the hours worked per day, per week or per year.

The concept of labour input refers to labour time expended in an establishment of an industry, either in terms of man-hours or number of workers. The man-hours concept refers to labour time only, and disregards the number of employees who work these hours. If the number of workers is used as a measure of labour input, changes in the average work day and work week are not accounted for. It is suggested that the entire number of man-hours worked gives a more accurate measure of labour input.

Although it would be worthwhile to weight man-hours according to efficiency, sex, age, training, experience and skill of the workers, so far data are not available for this type of analysis.

Furthermore, the labour input factor could mean labour expended on a definite group of operations, or it could include the preliminary work for the manufacture of raw materials and part of the labour input corresponding to the manufacture of equipment and other allied parts of machinery. This definition corresponds with "value added" through the process of manufacture only.

Our main purpose, however, is to determine the rate of productivity. It is therefore advisable to use hours of work as the input factor. It may be pointed out that all hours of work are counted in the same way, and no distinction is made between hours worked by male and female workers, skilled or apprentice workers, and normal day or night or overtime work.

In the analysis of man-hours, one may face a problem of distinguishing between "man-hours paid for" and "man-hours worked." The concept of "man-hours paid for" is more frequently used, since it has been easier to collect such figures. The "man-hours paid for" which include hours not worked such as reporting time, rest periods, sick leave, holidays and paid vacation, provide a more useful measure of labour time required for production within the framework of existing institutional arrangements. They also signify the gross amount of labour that must be purchased for continued production.

We can put the measurement of productivity in terms of an extremely simple formula: $P = \frac{O}{M}$, where P reflects productivity of labour, O the units of output and M the man-hours or efforts input.

In India man-hours data are available for 29 organized industries in the Census

of Manufactures, 1954. These industries account for approximately 60 per cent of industrial employment in the country. Since production statistics for each of these industries are also available, we may be able to compute productivity ratio for each industry. But the employment of this simple, basic formula, one can work out ratio of productivity for a firm, or even an industry. Productivity can be measured over a period of time for the same economy, or it could be worked out for various countries, provided comparable data for output and input are available.

Over a period of time it would be necessary to calculate the ratio of labour that would have been spent in the current period to produce the base period complex of goods to the total labour actually expended in the base period.⁷ Laspeyres formula takes care of these historical changes in productivity. This formula simply amounts to productivity being a quotient of the unit of labour requirement in the current period divided by the unit labour requirement in the base period, that is the point or period of time with which we want to establish a comparison. The only defect in this formula is that it takes into account the base period complex of goods. Passche formula is an improvement on this in the sense that comparison is made on the basis of the current complex of goods. In this formula, productivity is the ratio of labour actually spent to produce the current complex of goods to the labour that would have been spent in the base period to produce the same complex.

Productivity Indices: All productivity data have to be presented in the form of indices. Indices of output per worker are obtained by dividing the index of production covering the output of an industry by the index of production worker employment. Indices of output

per man-hour are obtained by dividing the production index by the index of production-worker man-hours. It is often a matter of choice which of the two approaches is used. Either method should prove to be equally useful in case where only one product is manufactured. When two or more products are included, it is necessary to establish an index of the number of man-hours required per unit of output. Since the productivity statistics are mainly concerned with performance of the economy as a whole, it is considered useful to employ the output per man-hour method. Production index weighted with unit man-hour requirements is theoretically the most suitable for measuring physical productivity in terms of labour input.

In India, man-hour figures are not, as yet, available for all industries. To overcome this difficulty, approximations can be made to the production index by using some substitute weights in place of man-hours per unit. In case, data are available for labour cost per unit for separate products in the base period and if labour cost per unit for separate products is proportional to man-hours per unit, approximately similar results can be obtained for the production index. Here, of course, we are assuming that average hourly earnings are about the same for the workers employed in the production of the various items included in the index. If wide variations in hourly wage rates exist, this technique will not be quite valid.

Various Measures of Productivity

The rate of economic growth for the economy can be measured in various ways, some of which are briefly examined below: (a) **Net Product Type index:** This would correspond broadly to net national income at factor cost. In India, this type of data is available for the past decade, in current as well as constant prices. However, man-hour figures for the Indian economy are not available, except for certain types of manufactur-

7. International Labour Office, *Methods of Labour Productivity Statistics*, Geneva, 1951, p. 56.

ing. Nonetheless, this type of productivity ratio—that is, net output related to man-hours—should be useful in assessing the significance of productivity development in the economy. Essentially, it is an attempt to analyse the ratio of man-hours required for current year's net output to man-hours required to produce the net product of the base year. Apparently, measuring productivity in terms of rupee value has the advantage of eliminating some of the difficulties in aggregating or comparing the physical output of different commodities. The only shortcoming of this type of measure is that it leads to the problem of price deflation. (b) **Value Added Approach:** The concept of value added (the value of deliveries less the sum of expenditures on raw materials, purchased electric energy, fuel, containers and contract work) is considered to be a useful measure of real economic growth. In other words, value added corresponds to the value created in the process of manufacturing. One advantage of this approach is that data for a wide group of Indian manufacturing industries are available. Moreover, value added has a fairly high labour content. There is, thus, some relationship between value added per unit and man-hours per unit. Although value added depends on many factors in addition to labour input, it clearly shows the change which would have taken place in the number of man-hours per rupee value added, provided there were no changes in commodity prices, as also in the cost of labour. If there is a relative increase in the production of items for which man-hours per rupee value added are low, the index of man-hours per unit will decline even though there is no change in man-hours per unit for any item.

A significant use of value added is that it can be related to wages of production workers. If we take wages as a per cent of value added ($\frac{\text{Wages}}{\text{Value added}} \times 100$), we know the share of the value added going to the production workers. If the

value added per worker or per man-hour is increasing and the ratio of wages of production workers to value added is stationary or declining, this indicates that workers are not sharing in the fruits of their efficiency.

Other Ratios: There is no complete unanimity of opinion on the adoption of labour effort as the principal input factor in measuring productivity of a firm or an industry. Some think that students of productivity are making a grave error in ignoring the effectiveness of capital and entrepreneurship. There is a point in this argument, for productivity is really the result of a combination of several factors. But it is a question of approach, and practically, of the availability of data. If data are available, say, for capital employed, its efficiency can be computed. In the industrially advanced countries of the world (such as the USA) where already adequate statistics are available, attempts have been made to work out capital output ratios.⁸ We can figure out the efficiency of capital by using the formula:

$$\text{Efficiency of capital} = \frac{\text{Net Output}}{\text{Capital Employed}}$$

Similarly we can attempt to measure the productivity of land by taking net output as the numerator and the number of acres as the denominator. Furthermore if one desires to determine whether the farmer stands to lose or gain in his daily transactions, it is necessary to calculate parity indices (terms of trade) for which the formula is as follows: Parity index = $\frac{\text{Prices received by farmer} \times 100}{\text{Prices paid by farmer}}$

Similarly if one intends to figure out the real earnings of workers, it would be necessary to compute the ratio of index

8. The reader is referred to a useful study by Daniel Cramers, *Capital and Output Trends in Manufacturing Industry, 1890—1948* (New York, National Bureau of Economic Research, Occasional Papers, No. 41, 1954).