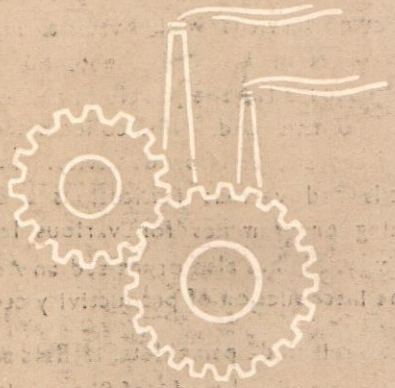
PRODUCTIVITY

JOURNAL OF NPC



NATIONAL PRODUCTIVITY COUNCIL, IND

FEB MARCH 1961

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 !

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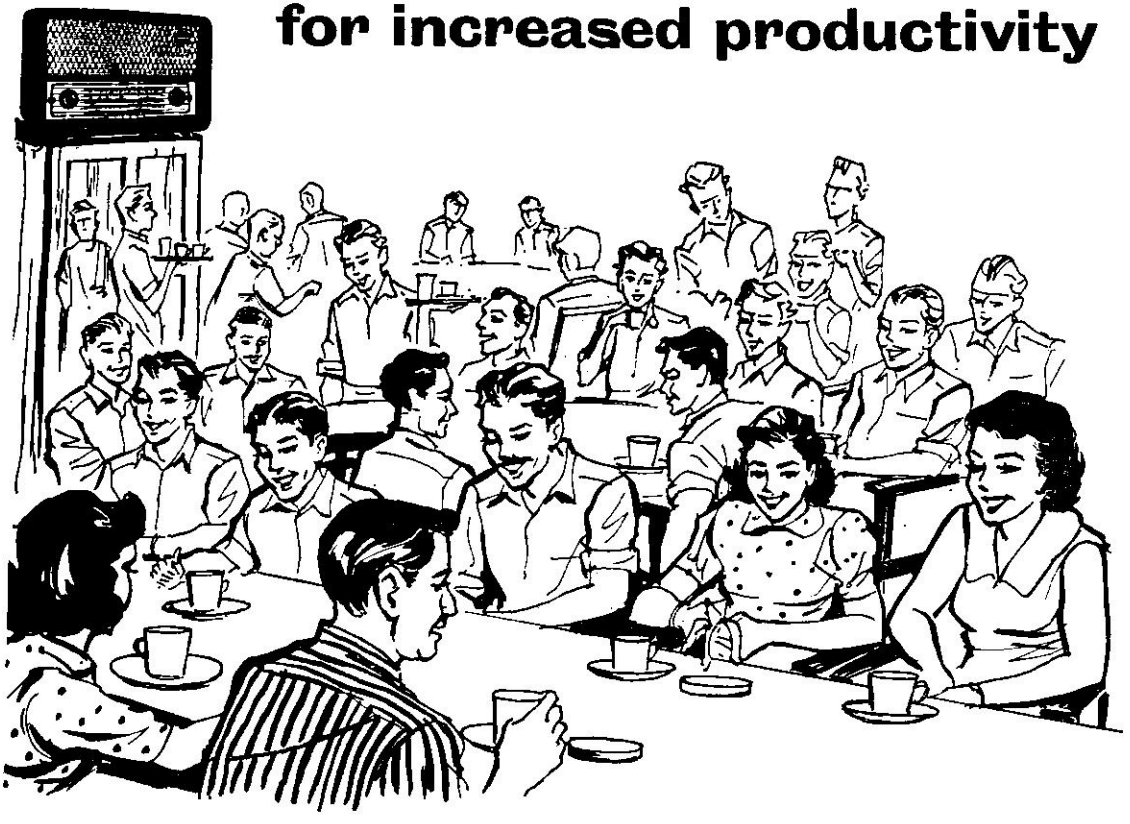

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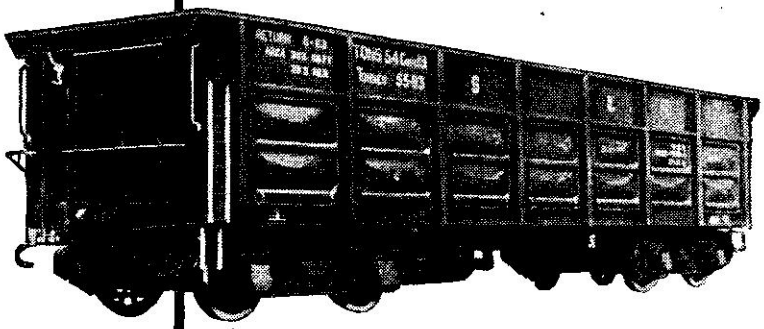

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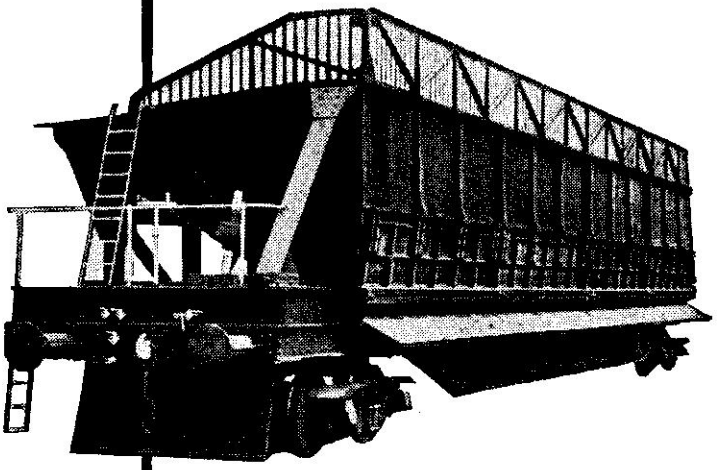

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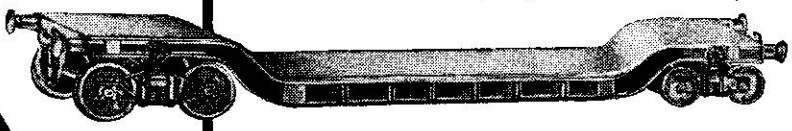

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PRODUCTIVITY

VOLUME 2 NUMBER 3 FEBRUARY—MARCH 1961

Have you ever been in a taxi when it has been held by a rai ed bridge or a traffic jam ? It is pretty uncomfortable to watch the meter run up your fare while you are getting no place.

···Suppose, by some stretch of the imagination, you had a meter on your desk that added up your pay every hour. Wouldn't this make you extremely conscious of exactly how much work you accomplished between each click of the meter to a successively higher figure ? It would probably also make you uncomfortable to see and hear that meter if, through no conscious fault of your own, you were continually delayed or prevented from accomplishing a productive hour's work...Although we do not recommend that managers instal any such devices at their desks, they can get real benefit from developing and using their own "mental" time meters... Look at it this way. As a manager, you are a seller, and your company is the buyer. Your commodity for sale is productive time—not total time. It is not the hours you put that count, it is what you put into the hours.

The Secret of Productivity

DURING the last 12 years since Independence, the makers of policy in this country have been in sincere search of that x factor that could dynamise the Indian economy. The prime minister's speech (printed on p. 219 of this Journal) inaugurating the Top Industrial Leaders' Conference held in New Delhi in December 1960, showed his acute appreciation of the critical factor or factors whose solution could unleash forces leading to a massive increase in industrial productivity. That the prime minister should have emphasised general education and specialised training as a powerful solution of the social and economic problems facing the country is significant. In a simple, modest way NPC has been making its contribution to specialised training.

The problem really is how to unleash dynamic forces to which the prime minister has referred. This probably involves a reorientation of attitudes of which a classic instance may be cited from the life and career of Henry Ford, quoted in an article on Business and Productivity, printed elsewhere in this Journal. The author has probed into the secrets of productivity as evidenced in the life and career of that most successful pioneer of modern business : Henry Ford. The record cited in the article is worth repeating.

STEVENSON : Now, I will ask you again, do you still think that those profits were awful profits ?"

FORD : "Well, I guess, I do, yes."

STEVENSON : "And for that reason you were not satisfied to continue making such awful profits ?"

FORD : "We don't seem to be able to keep the profits down."

STEVENSON : "Are you trying to keep them down ? What is the Ford Motor Company organised for except profits, will you tell me, Mr Ford ?"

FORD : "Organised to do as much good as we can, everywhere, for everybody concerned. To do as much as possible for everybody concerned. To make money and use it, give employment and send out the car where people can use it. And *incidentally to make money.*"

STEVENSON : "Incidentally make money ?"

FORD : "Yes, sir."

STEVENSON : "But your controlling feature is to employ a great army of men at high wages, to reduce the selling price of your car, so that a lot of people can buy it at a cheap price and give everybody a car that wants one."

FORD : "If you give all that, the money will fall into your hands. You can't get out of it."

Henry Ford was a powerful and successful businessman. He contributed massively to increase in employment, wages and the availability of cheap transport for the mass of the people *and incidentally made money.* This is the secret of productivity that

Indian industry has to learn. But this philosophy must go alongside the observance of a code of discipline and a code of efficiency to which Sri Gulzarilal Nanda refers in another article printed in this Journal. A distinguished labour leader Sri Khandubhai Desai has shown (in an article printed on page 230) how practical Gandhiji's philosophy has been in the sphere of industrial relations at Ahmedabad. Gandhiji's philosophy of industry is that it is a sort of trusteeship for the nation, labour and management being co-trustees for the community as a whole. Acting in this spirit, the major industrial city of Ahmedabad has had no industrial conflict for nearly 40 years and Sri Khandubhai Desai claims that the textile workers of Ahmedabad enjoy the highest real wage in the industry as a whole due to labour having followed the industrial philosophy of Mahatma Gandhi. Sri Khandubhai has cited other case studies of his own, where this philosophy has worked and yielded results. Mahatma Gandhi's intervention in the industrial field has been referred to by Mr RL Mitchell in another realistic article which emphasises the need of making preparations for training of professional managers from within Indian industry. This is a continuation of a valuable contribution Mr Mitchell made to this Journal in his article on A Tale of Two Factories (printed in volume 2. number 1) in which he emphasised the crucial role of the foreman in Indian industry.

This brings us to a somewhat technical level and in this direction we would like to refer the readers to the point of view of the production engineer (page 240 of this issue) with regard to the Fundamentals of Productivity. The author speaks from intimate experience of Central Railway Workshops. The theory of work study, work measurement and their application on ground level have been dealt with in a manner as to be of practical use to the people managing workshops in India.

If we are really to increase productivity, we must increase our technical knowledge. For that purpose NPC provides a technical enquiry service, a number of valuable reports having been received in this connection from the Technical Cooperation Mission of the USA. They are freely available to all industries at a very nominal price covering the cost of reproduction. The type of material available has been printed along with necessary details towards the end of this Journal. This is a continuation of the series printed in volume 1 number 5. The reports give intimate details of technical devices and gadgets and are fully documented.

Above all, the best secret of productivity is efficient management. Managerial talent does not come from above; it has to be developed. In this connection, we would like to draw attention to an article (on page 252) by a man of considerable managerial experience, Mr Turner. The thesis presented by the author on 'Developing Tomorrow's Managers' has a somewhat unusual depth and significance, particulary in regard to making both private and public organisations more productive than they are.

For the best advice, however, we have to go back to what the prime minister has said on page 222. "We, of course, need training for good efficient business and industrial management but what is more important is to keep a track of the changing world. It requires a a vigilant mind and understanding... to keep pace with developments and to make the utmost profit out of them... In so far as India is concerned it requires a great deal of discipline in our thinking and action: above all cooperation in all matters."

Productivity and the Future of India

JAWAHARLAL NEHRU

So far as the question of increasing productivity is concerned, there can be no two opinions. I have no direct experience of the techniques of productivity but in a non-technical yet significant sense, all of us are concerned about productivity: its basic principles, the basic objectives of the productivity movement and the broad lines of approach. It is with the latter that I am particularly concerned.

IT is not only necessary to know what one is aiming at, at the moment, but also what the future target is, not only the immediate future but the rather distant future, 10 or 15 years, may be even 20 years hence. There is, of course, no means by which we can get a rigid blueprint for the future; and we should not attempt this impossible task because of the tremendous pace of technological change and the new kinds of powers that are constantly coming into general use. The whole of the industrial revolution depended on new types of power coming into play: steam or electricity; and new techniques developed round the new basis of power. In the post-war period the development of new sources of power and the techniques associated with them have begun to change at a pace that compels looking ahead. Hence to remain too much attached in a static way to present conditions can well make us lose ground, while we try to fit in the world of today. The most productive social approach therefore is to be prepared for the changes of which the signs are apparent.

It is most important to have an open, flexible and vigilant mind with regard to what is happening in the domain of science and technology, which affects not only productive processes and techniques but also life in general. A reorientation, therefore, of general education is called for. It is, of course, necessary to have special schools for industrial management and the like. They are very necessary, no doubt, but if the country has got to become really industrialised, the entire population has to be accordingly educated. Countries which started early in the race of industrialisation immediately felt the need of general primary education which has been progressively raised to higher standards. In the history of industrial progress, Japan's case is probably the most significant. When in the last century Japan decided to go in for industrialisation, they had a regular plan and one of the earliest things they decided upon was universal primary education.

We in India must also have a broad base from which to draw people into the whole gamut of industrial processes. Industrialisation is not a question merely of putting up a single factory or a single industry, however big it might be. Industrialisation is really a massive

* Resume of the Prime Minister's inaugural speech at the NPC—ILO Industrial Leaders Conference, December 1960

social process: a big reservoir out of which people of various talents and aptitudes come up. Universal education therefore is the base for a productive economy. It is of course necessary to educate the top people but that is not enough.

Education again is the biggest single factor in bringing about that change of mind which we require for an industrial revolution. The basic problem in India still is, how to introduce a different outlook in this vast population. I am thinking at the moment, as I often do, more of the rural masses than of city folks because the latter undergo changes somewhat more rapidly than our peasantry. It is this enormous mass of rural people, who constitute the most material factor in productivity, for they pull down or push up developments in the country. The greatest social revolution that we have to bring about is a change in their static, traditional, conventional outlook. Of course, changes are coming to villages but we have to make a deliberate attempt at introducing modern techniques in rural areas, and what is more important, modern methods of thinking.

It is necessary to emphasise in this connection that modern methods of thinking do not inevitably flow from the application of modern techniques. It is often the case that persons who have made good in building up a plant or a factory, are yet wrapped up in a way of thinking which has no relation to the modern world. This is the cause of industrial conflict: *the application of modern techniques by medieval minds.* This is also the reason why I lay so much stress on widespread education.

There is another aspect of education which I would like to emphasise: specialised training. At present only those who can afford it, get it. On the other hand, the vast mass of people have hardly any access to specialised training. This is a tragedy because the vast mass of people in India have a fairly high intellectual standard, quite high enough, I think, to compare almost with any country, provided they get a chance. It is a very important matter to give a chance to these people to go in for further training. We should have a sort of rule by which bright students automatically get a chance for higher studies at the expense of the State. Almost any amount spent in giving bright boys and girls a chance to get higher training is socially worthwhile. It is of the highest public importance to open out these reservoirs of energy that now lie dormant in the nation. Whatever industrialists are doing in their limited spheres is no doubt good and helpful but the basic thing always is for a nation to unleash forces which may have been tied up or suppressed by political or economic conditions and by various other factors. It is this unleashing, this opening out of forces, that give life to the country and that dynamic urge to go ahead. *All the cleverness at the top—which is of course good and welcome—will not take us far*, unless we unleash these forces. On the other hand there are the forces of technology, atomic power, cosmic rays and what not. It is essential that we put these to productive, peaceful uses for the common man but *the basic thing is to build and raise the quality of the people.*

This is our basic objective. All other objectives are subsidiary: even the objective of productivity, but it is nevertheless most important for the nation. How do we achieve it? *The whole nation will not make the necessary massive effort for productivity only to make some individuals richer.* Of course, individuals need incentives but *individual incentives are not sufficient for national effort.* Hence we have had to look at the productivity movement from the point of view of the people as a whole. The objective is national prosperity and the people as a whole

reaching higher standards of living. In a democratic political structure, one has inevitably to aim at widespread benefits accruing to the whole community. Further it is essential to make it the objective of policy that the people actually realise that either they are getting or will certainly get the benefits of whatever efforts they make in the direction of higher productivity. *They will not make the necessary effort if they feel that their labour is being used too much for private advantage.*

Further, in the application of productivity techniques, we must know that there is an essential difference as between an underdeveloped country like India and highly developed countries like the USA, the UK, Germany and Russia. Many things of course are common but in the steps we have to take, to make the economy more productive, the approach will necessarily be different. There is a tendency among us to copy what is being done in the USA or other countries which have accomplished industrial development. To some extent we have to copy and to learn from abroad but unless we take into consideration the different conditions that obtain in this country, we shall not make rapid progress. Till about 10 years ago our university text books on economics dealt with the economics of the western world, because the people who wrote them lived there; and they dealt with their own economic problems in the context of their own conditions. The same economics were taught to our students and an attempt was made to apply them here. It is only in the last 10 years or so that it has gradually come to be understood that *the economics of the country are not something in the air but they develop out of the context of people's lives, their problems etc.* America has a Affluent Society. We are industrially, technologically, financially backward. These are therefore two separate cases.

Again, in our case, there is a very large and growing population. Every problem has therefore to be viewed from the point of view of employment and *getting something out of the vast mass of people, some productive effort, even though it be little.* We are now 430 million. If on an average, every person increases his contribution to the national income by one anna a day, it will mean an annual addition of Rs 9810 million to the national income; if you make it two or three annas a day, it will mean so much more.

Hence the importance of cottage industries in India. I am quite convinced that *the people of India cannot advance by primitive methods* of producing goods; yet the so-called primitive methods can make an enormous difference when a large section of the population is not using any method at all, or more primitive methods. We have therefore to evolve in this country a balanced system of economics. There must be a background of the scientific and technological mind but we must not lose sight of actual conditions and the valid approaches necessary to make the whole community advance along a wide front.

We have to realise that from many points of view we are rather backward even in the world of capitalism. We are backward, as I have said previously, because our thinking is conditioned by conventional ideas, customs etc which come in the way of a scientific approach. We live partly in touch with modern technological growth and partly, completely away from it. It may be a broad generalisation but it is nevertheless true that we cannot live either individually or nationally if we are torn between traditional and the latest advances in science and art.

Further it is worth repetition that in this democratic age, we cannot do anything really big without the complete

cooperation of the larger community of the common people. It may be possible to succeed in a very fine way over limited fields, but the whole community cannot move without its goodwill and active cooperation. In industry, as organised today, there is a conflict between so-called capital and so-called labour, a pull in different directions, which is very illogical and unreasonable. It clearly indicates that there is something wrong in the organisation of society which permits this type of conflict. Of course, there may be occasional pulls, this way or that way, but there must be ways of not allowing those different pulls to do injury to the State or to the community or to production.

In industrial production, one of the major essentials, apart from modern techniques, is a background of goodwill and cooperation. Without it, the best of techniques may fail or may not produce results. We must therefore think of building up this background of goodwill and cooperation. A good labour officer who goes round and pats the workers on the back and tries to be generally friendly with them, is, of course, good and essential but this background of goodwill and cooperation is something deeper than a good labour officer. It is something which appeals to the mass of workers: a system that does not irritate them constantly. If labour has a feeling of not having a fair share, there will be trouble. It may often be that technically competent labour is bossed over by technically incompetent persons who get the money. Surely, there cannot be much love lost between the two. People who make much profits are not necessarily men of intellectual eminence or other great qualities. Hence conflicts and frustrations arise. We have therefore to think in some creative way of coordinating national work in the industrial domain. We have to consider workers' participation in industry. I have no doubt that it is inevitable and that it will give good results all round because labour participation in industry is based on sound psychology and is practical.

We of course need training for good, efficient business or industrial management but what is more important is to keep a track of the changing world. It is no longer a static world. It requires a vigilant mind and an understanding of these rapidly changing circumstances in the world, to keep pace with developments and to make the utmost profit out of them in the national interest. In so far as India is concerned, it requires a great deal of discipline in our thinking and action: above all cooperation in all matters.

Charles Schwab, one of the few men ever to be paid a million dollars a year in salary, said that his most precious personal asset was his capacity to arouse enthusiasm among his men. He added : "..... take away my plants, take away my inventory, but leave me these men, and I will build another steel empire."

Productivity Movement and the Nation

GULZARILAL NANDA*

The Productivity Movement in India must take into consideration the national ideals enshrined in the constitution and the basic economic needs of the nation. It would be good for us to recall the Directive Principles of State Policy embodied in the Constitution:

"....The State shall strive to promote the welfare of the people by securing and protecting as effectively as it may a social order in which justice, social, economic and political, shall inform all the institutions of the national life ... The State shall, in particular, direct its policy towards securing (a) that the citizens, men and women equally, have the right to an adequate means of livelihood; (b) that the ownership and control of the material resources of the community are so distributed as best to subserve the common good; (c) that the operation of the economic system does not result in the concentration of wealth and means of production to the common detriment ... The State shall, within the limits of its economic capacity and development, make effective provision for securing the right to work, to education and to public assistance in cases of unemployment, old age, sickness and disablement, and in other cases of undeserved want... The State shall make provision for securing just and humane conditions of work... The State shall endeavour to secure, by suitable legislation or economic organisation or in any other way, to all workers, agricultural, industrial or otherwise, work, a living wage, conditions of work ensuring a decent standard of life...and social and cultural opportunities ...."

The political ideals enshrined in the Constitution and the conditions which prevailed in the country at the time of independence, set for the people of India the nature and size of the tasks, which lay before them in the years ahead. The Constitution also postulates the play of the largest freedom in every sphere on the basis of democratic institutions in a highly developed form. The Productivity Movement has to shape itself accordingly.

* Minister of Labour, Employment and Planning, Government of India.

WHEN independence came, the country betrayed in economic terms all the symptoms of under-development. We have moved forward in many directions since then, but in many respects the economic picture is still much the same. We have a large population multiplying at an increasing rate, the bulk of it depending on agricultural pursuits. Per capita income is exceedingly low and the disparities in the distribution of income are very wide. Techniques and equipment as well as a proportion of our food requirements have to be imported from outside. There is slow growth of capital formation. The human resources of the country remain unemployed or underemployed, on a considerable scale. The outlook of those in administration, industry and business, of the working class and the people generally, is still in the process of being attuned to the demands of the new system and a new way of life which has to emerge.

It did not take us long to recognize that in the absence of a planned approach to the development and utilization of the limited resources available in the country, no substantial degree of progress could be achieved. The Five Year Plans of India have attempted to translate into specific aims and concrete targets, the needs of the people and the possibilities of development.

The course which lay before us was quite clear from the start. After undoing the damage which war and partition had done, a massive programme of industrialization has to be undertaken as the principal means of diversification of the economy, creating adequate employment opportunities and lifting the vast masses of the country above the poverty line. Programmes of agricultural development and the promotion of general and technical education and various health schemes constitute the essential base for creating the new industrial structure. After an initial period of assistance of a large magnitude from outside sources, the economy of the country has to grow on its own resources and strength.

It was realized that progress of this character and at this rate, consistently with the up-keep of democratic institutions, is not possible without a similar drive towards equality of opportunity and a progressive reduction in the existing disparities. The struggle for freedom had created strong urges for economic and social equality which are now clamouring for expression. The political, economic and social fabric which can be an answer to this manifold challenge is the socialist pattern which we are seeking to create with the help of the five years plans. Into this picture, labour as well as management and industrial enterprises in India, whether in the public or the private sector, are being called upon to fit themselves.

The essence of this approach lies in the assumption that industrial relations are not the exclusive concern of the worker and the management. The community is deeply interested and involved in what happens in this field and on its behalf the State must adequately discharge its inherent responsibility. On this basis we can think of a few essential constituents of any policy for labour, in the circumstances of this country. It is obvious that industrial conflicts whether in the form of strikes, lock-outs or as latent unrest leading to continuous friction and tension are exceedingly wasteful and a serious drag on progress. No sustained or real increase in productivity is conceivable unless a degree of harmony obtains in the relations of management and labour. To keep up even a modest rate of growth in the economy and to ensure for the workers some steady progress towards a living wage, higher levels of productivity must be attained. Such a rise in productivity has necessarily to be based

on technological improvement, but there is much still to be achieved in our country through a more effective use of the existing resources, especially its manpower. This can come about only if there is a climate of discipline and goodwill in the work place.

Of equal importance is the development of managerial skills and the availability of an efficient labour force. They have to be created and trained. The requirements of health and personal efficiency of the worker should be a matter of no less concern to the management than the kind and quality of equipment and material. The attitudes of the workers and the tone of their minds and their level of enlightenment have a much larger bearing on their work and output than is generally realized. Satisfaction of the material needs of the workers should be ensured to the utmost extent possible. Our capacity to stimulate activity by material rewards is, however, limited in this country, in the present conditions. Any scheme for raising national productivity through non-material incentives has therefore an important role. There is a range of things which will appeal to the minds of the workers and create psychological satisfaction. It is here also that the consideration of a social order based on justice and equality, because of its powerful appeal becomes a relevant factor. The leadership of the workers and their trade unions have to be enlisted as active participants in all these endeavours.

The principles which govern the regulation of industrial relations in this country and the machinery which has been developed for the purpose, have given rise to several questions and call for a certain amount of clarification. The field which is subject to the processes of adjudication comes under legal sanctions. In this, direct action by the parties is barred. The law arms the Government with power to refer to adjudication, disputes between employers and workers, and employees may reasonably expect the State to move its machinery for the settlement of any genuine dispute, at their instance, when an occasion arises. This position has now been accepted by the Government as a result of tripartite deliberations. There is this consideration also that the uninhibited access to outside agencies for the settlement of disputes acts as a disincentive to spontaneous voluntary arrangements and internal settlements. Certain consequences flow from this fact which have a bearing on the efficient conduct of industries and exercise a deep influence on the character of the labour movement. A legalistic turn of mind develops and the matters in the dispute are taken from one tribunal or court to another. Even the Supreme Court is burdened with references, all of which are not necessarily of any great consequence really. The struggle is thus transferred to another arena, the spirit of conflict being still at work. Delays occur which generate bitterness and frustration and vitiate the atmosphere of employer-employee relations and this might be no less inimical to good working and good production than strikes and lockouts.

There is another flaw that is prone to develop in a system which provides for the judicial determination of every dispute. These facilities while conferring a sense of security on the workers, and giving them protection against arbitrary demands may militate against the requirements of efficiency and discipline to such an extent as to thwart the efforts to raise productivity. Remedy has therefore to be sought for these and other undesirable features which have been disfiguring industrial relations in the country.

A careful review of the situation and a thorough discussion of the problems in

tripartite meetings, while leading to a reaffirmation of the existing policy, have also brought about a strong consensus of opinion in favour of its reorientation. A specific approach of which the most conspicuous symbol is the Code of Discipline, has thus taken shape. There is general agreement in the country that the absence of State regulation in the field of industrial relations would be fraught with grave risks and likely to produce such great harm that the faults and deficiencies associated with the present system must be dealt with in other ways. If the present avenues of settlement were not available, unrest would grow. Manifestations of violence in industry which even now occur at times are likely to assume much larger proportions if there is no sure means of securing justice and if a trial of strength and staying power alone govern the outcome of disputes. Such a contest is, in any case, not a more civilised way of arranging matters than decisions which are based on the impartial judgment of an independent judicial person. Answer to some of these problems is being furnished in the Code of Discipline which has been set out in terms of clear-cut obligations of the employers and employees. The fulfilment of these obligations would become a powerful factor in creating harmonious relations, avoiding interruptions of work and paving the way for more efficient operation of industry.

The stress now is on prevention of the growth of unrest by timely action at the appropriate stages and giving adequate attention to root causes. The excesses and complications arising out of trade union rivalries are to an extent checked by the Code of Conduct which governs the mutual relations of the different sections of the labour movement. Adjudication has to be progressively replaced by arbitration whenever negotiations, conciliation and mediation fail to bring about an amicable settlement. The Government of India has accepted the principle of compulsory arbitration in its dealings with its own employees. Both arbitration and adjudication will be facilitated by the availability of norms and standards with the help of which differences could be settled more easily and promptly. They have to be arrived at mostly by agreement among top representatives of the workers and the employers. The most contentious problem of rationalization in industry has been settled on these lines. There is an understanding that appeals to higher courts and tribunals should be discouraged. To give arbitration a better chance of success, the approach of the parties should be positive and constructive, and extravagant and unreasonable claims should be altogether eschewed. The Code provides that a regular grievance procedure be laid down in all undertakings and complaints should receive prompt attention. The legal means of redress and the channels open under the Code of Discipline should be fully availed of and there should be no direct, arbitrary or unilateral action on either side. Under the Code, workers and management have agreed to avoid litigation, sit-down and stay-in-strikes and lockouts. There will be no recourse to coercion, intimidation, victimization or go-slow. The Unions agree not to engage in any form of physical duress and to discourage unfair practices such as negligence of duty, careless operation, damage to property, interference with or disturbance to normal work and insubordination. The employers have to abide by the criteria adopted for determining which union has a better claim to recognition and a union guilty of a breach of the Code of Discipline loses its right to such recognition. Both sides are pledged to the scrupulous and prompt implementation of awards, agreements, settlements and decisions. Organizations of employers as well as workers have bound them-

selves to express disapproval and take appropriate action against officers, office bearers and workers who violate the letter or spirit of the Code.

I am convinced that if full use is made of the new possibilities that are being created for bringing about a radical change for the better in the labour situation, management will have placed under its feet solid ground for achieving its assigned tasks with confidence. The foundations will have been laid for the successful pursuit of varied programmes for raising the levels of productivity in our industry.

There are two primary conditions of success. There should be a wholehearted and unreserved acceptance of the principles embodied in the Code and the prescribed obligations. The spirit of constructive cooperation should prevail in all the mutual dealings between the workers and the management. Secondly, each side must ensure that violations on the part of the members are discouraged and sanctions are applied by their organisations so that the tradition of loyal observance of the Code grows up rapidly. We have been contemplating the introduction of a Code of Efficiency and Welfare on the same lines. It was felt that we should consolidate the ground with regard to the Code of Discipline somewhat before taking the next step.[1]

Two programmes of basic importance have been initiated by Government: Workers' Education and Workers' Participation in Management. These are two pillars without which the edifice of good industrial relations must remain incomplete. The formative influences which are being released through our programme of workers' education can become a powerful ally of a positive policy for building up industrial peace and efficiency. Workers' association with management of industry is a cardinal tenet of my economic faith. I am well aware of the fact that in certain advanced industrial countries, the workers' concern is only in obtaining an annual rise in the wage scale and the employers stand firm on the prerogative of the management to manage. I envisage even for these countries, the inevitability of a trend growing in the direction of increasing association of workers with management in course of time. In the conditions of India this is an imperative necessity for the sake of economic progress as well as the realisation of our social ideals. The full fruition of democracy in this country pre-supposes an extension of this principle to industry and involves workers' co-ownership, co-partnership, or co-trusteeship in industrial undertakings. Insofar as the management is concerned, the new concept will have to be recognised that the function of the management is to be exercised not on behalf of the shareholders or owners of capital only but also on behalf of the workers whose contribution is of even more vital importance. A number of units in which the scheme of workers' participation—of a very elementary character—has been initiated, have so far on the whole recorded encouraging results.

A few observations may be made here about the question of wages. The wage structure in the country is a product of judicial decisions for the most part. The method of settlement of wage scales by wage boards—an extension of the principles of voluntary settlement, collective bargaining and mediation—is a healthy and hopeful development which represents now the most advanced stage in the evolution of the machinery for wage determination. A wage board is composed of employers, workers, indepen-

[1] A good beginning in this direction was made at the Seminar organised by the NPC in October 1960, where basic principles bearing on this objective were adopted.

dent persons and an impartial chairman. The frame of reference for the Boards which now takes up whole industries as units, at the national level, has been provided by the unanimous recommendations of the Report of the Fair Wages Committee which had among its members representatives of employers and workers at the highest level. The unanimous recommendations of Wage Boards must be treated as completely binding on all the units in an industry: employers as well as the workers. There has been a degree of remissness in the implementation of the recommendations of some of these Boards. In the interests of orderly development of economic life, the unanimous recommendations of Wage Boards should be carried out promptly and faithfully, however onerous they may appear to be in relation to individual cases.

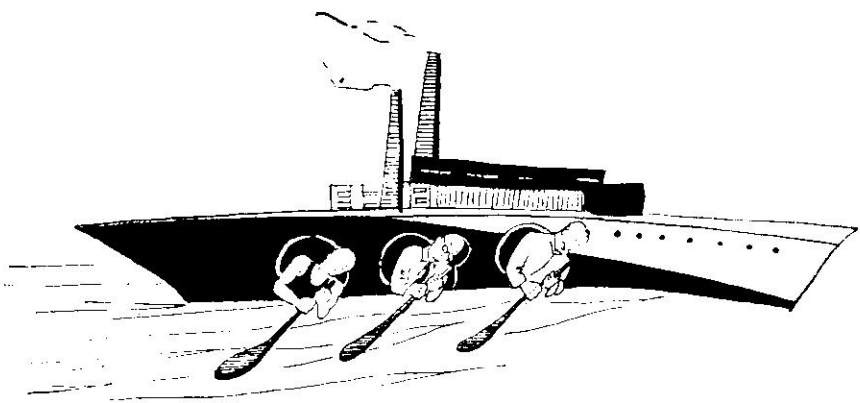
Needless apprehension and some misunderstanding have arisen in connection with the recommendations of the 15th Session of the Indian Labour Conference on the subject of what is being described as the need-based minimum wage. In a country where the wage scales are laid down by Boards and Tribunals, norms have to be evolved to furnish guidance for decisions based on objective considerations. An appraisal in physical and financial terms of the minimum requirements of a working class family for the maintenance of health and efficiency at the most elementary standards, was a responsibility of the Indian Labour Conference which could not be evaded. The basis adopted by the Conference, by common consent, cannot be regarded as unreasonable and adequate safeguards have been provided against any possible harmful results from its application, in the present circumstances.

An advance to this position is in my view the most essential constituent of a socialist pattern for India. It is essential also for any country, socialist or otherwise, which cares for the dignity and worth of the human being in society. It should not be inferred from what I have said that the need-based minimum should be for all or none. It has to begin somewhere. This should be the first charge on the proceeds of industry everywhere while meeting other reasonable obligations at the minimum level. The whole social system will have, however, to be re-ordered to make the widest application of this principle possible.

After providing the floor of economic security steps must be taken to tap to the fullest extent the energy, intelligence and capacity of every worker. Various incentive schemes have been devised. It is not possible for me here to evaluate their comparative merits or usefulness. I have my own belief that while the material interest of the worker should be enlisted in the cause of productivity, it is possible to carry these monetary incentives too far for the good of anyone. The moral qualities of a human being, the inborn urge to express himself and excel in work, pride in performance and the sense of social responsibility provide an ample reserve for being drawn upon to improve the quality and size of the output. I am inclined to the view that, for several purposes, it will help us more to take the working group as a unit of activity rather than the individual worker and the scheme of incentives should be aimed at the group no less than at the individual. One thing, however, has become obvious that for most workers in organised industry any prospect of a substantial improvement in their earnings depends on our capacity to raise the level of productivity.

Another aspect of the wage question may be examined here. Even where a higher scale of wages is feasible otherwise, it is being sought to be denied to the worker on the ground that the increased purchasing power in their

hands would aggravate inflationary pressures and the more the workers consume, the less would be the savings available for investment. This is a sound line of argument but it misses the fact that it is possible to give a fair deal to the workers without having to face these unpleasant consequences if the additional wages or bonuses beyond a certain level are invested on behalf of the workers in the shares of the company in which the workers are employed or of a holding company or go into the normal channels of national savings. It has all the time to be recognised that the wage level has to keep in view not only those who are in employment now, but the much larger number for whom employment has to be provided through an enlarged volume of investment. At the same time, the cost structure of industry has also to be determined in relation to the needs and interests of the consumers in the country and the pressing obligation to sell our goods in foreign markets on a competitive basis.



Let us pull together

Industrial Relations & Productivity

KHANDUBHAI DESAI[1]

The distinguished author of this article, who is now a veteran labour leader, had the rare good fortune of working under Mahatma Gandhi. It may be considered as an act of fate that Gandhiji began his career at Ahmedabad and was naturally involved in its industrial problems, as that great city had by then emerged as among the most important centres of textile production. Sri Gulzarilal Nanda[2] (at present Minister of Labour in the Government of India) and the author were, in this context, called upon to work under Gandhiji. Sri Nanda and the author had learnt their lessons from the text-books of the western labour movement and were therefore naturally predisposed to accept the text-book theories. Gandhiji, however, told them (that was 40 years ago) that industry belongs to the workers as much as to the management, but not the least, to the community. The employers must therefore create the psychology of being co-workers with even the marginal man employed in the industry. As far as the worker was concerned, we must develop in him the psychology of co-ownership. Both management and labour must work as co-trustees of the nation as a whole. Further—and this is the most important part of Gandhiji's philosophy—that everybody engaged in production (or in any other activity) must himself act correctly without thinking what the others do or do not. It is of course a hard job to work out Gandhiji's philosophy in the present conflicting industrial system. The following account of industrial relations, as they have developed during the last 40 years as a result of the author's consistent follow-up of Gandhiji's philosophy, may appear somewhat romantic but it is a recorded fact that Ahmedabad of all the world's industrial cities has the unique privilege of having had no industrial disturbance during the last 38 years!

WHEN Gandhiji started his great experiment in industrial relations in Ahmedabad 40 years ago, based on his theory of industry as a national trust, and management and labour as co-workers and co-trustees, there were of course a few enlightened employers in Ahmedabad who appreciated this philosophy and desired to practise it. But the broadening of this base and the outstanding success that this programme of industrial relations has achieved are in a very large measure due to the wisdom, the farsightedness and above all the sound social philosophy of Mahatma Gandhi. It is to his credit that the fruits of industrial peace are being enjoyed by everybody in this great industrial city. Research and economic statistics have established the fact that the textile in-

[1] Textile Labour Association, Ahmedabad.

[2] His article on Productivity and The Nation appears on page 223.

dustry in Ahmedabad has the highest wages alongside high profits and these are supported by the highest efficiency in the textile industry in India. All this has been achieved without violence, without the usual struggles that are a common part of industrial life. The productivity of this industrial society therefore is worth studying.

I shall try to summarise the basic philosophy of this great experiment. The basic truth underlying this experiment in industrial relations is that nothing is more harmful to industry than a purely negative attitude to the demands of workers, whether those demands relate to personal affairs, wages, bonus or conditions of work. In this connection I would like to place on record a few case studies with which I have been associated in recent times.

An industrial concern, whose name I may not mention, never made any profits. A bad workman finds fault with his tools; so the management thought that there was something wrong with the workers, which accounted for the losses. On the other hand the workers held the management responsible for the state of affairs in which the factory found itself. After a decade or so of losses, the management had to take a decision regarding the closure of the mill which employed as many as 3000 workers or thereabout. At that critical point, it somehow dawned on the owners that there was something really wrong with the management; and that an enlightened management in the unit as a whole and on the shop floor, could set standards of efficiency which might alter the state of affairs to the advantage of all concerned. This was done, and the whole factory atmosphere underwent a change. Methods of appointing supervisors and technicians were rationalised; and a good management began to operate the mill. Losses gave place to profits; output went up; quality improved; and naturally, wages also went up. A stage was reached when the workers themselves came forward and asked for rationalisation.

The whole truth is that a factory can only be efficiently operated, if management and labour work it in a family spirit. The owners must consider the workers as members of their own family. Of course, there would be conflicts, but they need not overwhelm the organisation. They could be overcome in the family spirit. Gandhiji attached considerable importance to settling disputes across the table, and at the limit, through voluntary arbitration. I am not an antagonist of compulsory adjudication. But it is a common sense proposition that the best industrial relations arise as a result of free collective bargaining, and failing that, resort to voluntary arbitration. I am of the opinion that class-conflict and class-war are not in accordance with the basic philosophy of the Indian people; and an atmosphere of class-conflict can only lead to mutual frustration. We require a change in approach; and the successful Ahmedabad experiment shows that it is now and here, possible.

Much controversy has been going on regarding the public and private sectors, particularly in respect of the character of management. In my opinion there is not much difference between the two sectors, as far as treatment of workers is concerned. In labour relations, both the sectors are chips of the same block, with this difference that management of public sector business is impersonal, at least in theory; in practice, most managing directors even in the public sector consider it their own private business. Really, managements both in the private and public sectors have much to learn.

Let us now try to see what happens in case of industrial disputes. In the first instance, management gives a nice talk

to the workers, who may be satisfied with what they are told. When the workers find out that the management has no intention of carrying out what they were told, there is naturally frustration with compound interest. This psychologically leads to lower worker productivity, because workers' minds are not in the work. This is not actually *Go slow* (to which I am strongly opposed) but it is only a psychological reaction to dissatisfaction with the management. It is suicidal to sabotage machinery, but machinery does go wrong when the workers are dissatisfied. That happens with all classes of people in all walks of life, not only industrial workers. So the problem can only be solved if management becomes psychologically responsive to what is happening in the mill.

These days, we have personnel managers who are supposed to be independent of management, but in actual practice it is not so. The labour officer or the labour welfare officer has become a subordinate third class tool in the hands of management. Managements are now-a-days appointing lawyers as labour welfare officers, to be on the look out for placing labour on the wrong side of the law; whereas the true function of a labour officer is to tackle human relation on the basis of a sound social psychology.

In the search for the causes of low productivity in Indian industries, we must also analyse it from the point of view of management. Half the valuable time of management in India is spent on bickerings and disputes: how much more could we get by way of industrial output from the employment of the same resources, if the brains of management were to be devoted to doing a better job of production than on the endless and fruitless attempt to solve problems in a manner that they can never be solved; for the problems have really created themselves through the persistent application of an unsound social philosophy.

Another illustration which comes to my mind is of a mine in Bihar. This was sometime in 1959. The old management was dealing with the workers as bad boys whose every demand must be turned down. I submitted my diagnosis to the proprietor of the mine and tried to argue with him that if the established approach were changed, things might work in a different way. He would not agree. Fortunately, a more discerning top executive came into the picture. He saw through things and accepted the only workable solution. Within six months, output rose from 5 to 16 thousand tons.

Another case study that may be cited is that of a good factory in the Punjab, engaged in a new line of production. Management was sick of the disputes that had gone on for three long years. The whole of its time was spent, day in and day out, in sorting out difficulties that arose almost continuously. The result, of course was low output but nevertheless the mill was making profits and the workers wanted a share, to which the management did not agree. At that point I had a chance to step in. I argued with the management that since they were making profits, it appeared legitimate to share a part of profits with the workers through a rise of wages: I named the amount. The management agreed: what happened may appear remarkable but is really natural: output, quality and profits went up. Sharing of profits led to an increase of profits!

Let us look at the problem in a human and common sense manner: if an industrial concern provides air-conditioned accommodation for its top executives, gives them high salaries, but refuses to pay a living wage to its workers, how can it expect to have high productivity?

The art of business management essentially consists in the effective harnessing of the energies of the working class. Of late, particularly since the second world war, the volume of literature on business management has increased considerably. Large numbers of our young men—some old men also—have gone to foreign countries to learn the art of human relations in the context of industrial organisation. In spite of this acquisition of foreign knowledge, it is apparent that old habits still persist: the old habit of imposing western standards without taking into consideration the particular circumstances of our country. Foreign trained business managers have tried to impose standard efficiency, workloads, rationalisation, automation and the like without taking into adequate consideration the climate and the environment that obtain in this country. Because these young men have been abroad and have seen things for themselves, they think that the mass of workers have also come up to their level and begin to act accordingly. This creates resistance and conflict in industry.

How can the problem of industrial relations be solved? In the first instance, the solution very obviously depends upon a very real desire among the major participants in industry, to solve it. Secondly, there must be the realisation of the stakes involved: if we do not satisfactorily solve this rather complex problem of industrial relations, our targets will remain unrealised, creating frustration, apart from the non-realisation of the national imperatives of development and security.

Thirdly, it must be realised that there is no *at once* method of resolving a major social problem. It can only be solved gradually; but it is necessary to be on the right path, and for that, a realistic analysis of the position as it obtains must be attempted. Management in India is a three-tier structure: the financial top executive, the administrative and technical executive and the middle executive consisting of the supervisory staff. Then, last but not the least, there are the mass of workers. The problem before us is how to bring about unison between these four factors.

The author cannot claim to be a great theoretician but the teaching of Gandhiji and persistence in that philosophy for 40 long years have convinced him that if we begin at some point we shall achieve the end. It will not come in a day. It has necessarily to be a gradual process but the decision to go that way has to be taken here and now.

A society, if it has to operate harmoniously and productively, must have a moral code. Government cannot afford to make a promise and then to break it, nor can private enterprise. An organisation, whether it be in the private sector or in the public sector, which operates this type of moral code, is bound to be in a state of low productivity. A sound moral code is the clue to optimum productivity.

A palm tree can't be grown in the Aretic, and an employee can't develop to his fullest capacity unless the work situation is one that will stimulate growth.

Management and the Worker

NAVAL H TATA

The relationship between the management and the worker has been the subject-matter of many discourses, discussions and debates. Voluminous literature has been dedicated to this fascinating, yet frustrating topic. Strangely enough, the solution of this problem is as elusive as the marital relations between husband and wife, on which subject many brave thinkers have propounded theories without much practical success. In both cases, the relationship is essentially one between human beings, where loyalty and mutual respect are vital ingredients. The analogy, however, is by no means complete and far-reaching. Unlike husbands and wives, between whom communication and contact are essentially direct, in the modern industrial set-up, intermediaries both on the side of the employer and the worker, are inevitable and unavoidable.

PRIOR to the Industrial Revolution, the worker was practically the owner. The position has since changed considerably. The problem of industrial relations emerges the moment he ceases to be the owner and becomes a wage-earner. At this very point, the basic conflict of interest, whether the employer is buying cheaply the efforts which the worker is trying to sell dearly, is generated. Until such conflict is either resolved or averted through a spirit of partnership, the problem remains a live one, in which the worker, the management and the Government have a vital stake.

The standard of human or industrial relations normally reflects the stage of development a country has achieved. Exploitation of labour was a common phenomenon in the earlier stages of industrial revolution, although it does not necessarily follow that the most industrially advanced countries have the best forms of human or industrial relations. This apparent paradox is due to the extent of State regulations to prevent the exploitation of the worker where his capacity to bargain is definitely weaker than that of the employer.

In the ultimate analysis, however, *sound and lasting industrial relations can never be legislated;* hence, the unavoidable need for an evolutionary process of building up healthy trade union organisations, enjoying full freedom of association. What remains to complete the picture is a healthy process of collective bargaining between genuine, responsible and truly representative employers' and employees' organisations. Unfortunately, one of the prerequisites of such an evolution is the suffering the worker must go through, in order to establish his right to function through a representative trade-union. These birth-pangs are often suppressed by a well-meaning and solicitous Government through misplaced kindness towards the worker. It often results in an abortive

attempt to promote by means of legislation, a trade-union movement, which cannot survive the test of time. If, in some of the industrially backward countries, the trade-union movement has not been firmly rooted in the soil, it is because of the imposition of a rigid system of compulsory adjudication which has intercepted the healthy process of collective bargaining. Such collective bargaining has been the basic feature of the natural growth of trade unionism in the progressive countries of the world.

It is not fair for an employer to suggest that the working class must suffer the normal birth-pangs in order to bring forth a trade union which can truly represent as their bargaining agent. If I am stressing this point even to the extent of embarrassing my position, it is because I firmly believe that an employer can hardly hope to establish a healthy and happy state of industrial relations, either at the national or unit level, unless there is a strong and healthy trade-union movement in the country, with its counterpart at the unit level. In fact, it is such a basic prerequisite for maintaining good labour-management relations that, no matter how cordial the individual relationship may be between the top-management and the worker, there is bound to be disruption and deterioration in such relationship collectively, in the absence of a strong and responsible trade union which can act as a bargaining agent on their behalf.

In view of the crucial role which intermediaries play in the relationship between the management and the workers, the attitude and behaviour of the top management are not the final determinants in gauging the industrial relations of a unit. Broadly speaking, there are three categories of intermediaries who play an important part in the chain of communication between the management and the worker: 1. managers and supervisors, paid by and acting for the employer 2. trade union representatives, acting as bargaining agents on behalf of the workers 3. government representatives acting as conciliators on behalf of the workers or the management.

The intermediaries in the employ of the management normally reflect the attitude and sentiments of the top management, except in cases where they unconsciously or deliberately misinterpret their employers. Very little attention was paid in the past to the training of this category of intermediaries to prepare them for the delicate task of handling the workers. So long as they were technically competent to deal with the affairs of the industry, they were considered useful to the organisation, no matter how poor they were in matters relating to human relations with the worker. In the last few years, there has been a noticeable change in the attitude of the management who, from the experience of industrially advanced countries, have learnt to look upon management training as an essential pre-requisite for continuance and promotion in service. In this training, the subject of human relations in industry has assumed growing importance. Progressive firms in India have now made it a practice of making their supervisory and managerial staff undergo regular courses of training to prepare them for their role as intermediaries in the chain of communication. In the long run, this changed attitude on the part of employers will go a great way in minimising the strong prejudice created over a period of years, through tactless handling of this delicate problem by the representatives of management who acted on their own or echoed the sentiments of reactionary employers. Regardless of any scientific training imparted to these intermediaries, so long as they act as the mouthpiece of the management, a lot will depend upon the basic philosophy and attitude adopted by management in establishing good relations with workers.

This attitude of mind will vary from unit to unit, depending upon the individual mental makeup of top management. However, in the broadest possible analysis, it could be classified into two varieties: a negative, unilateral punitive approach, with dismissal, fines and sanctions as deterrents; or a positive benevolent approach reflecting the good character and philosophy of the head of the enterprise.

There are ardent advocates of both schools of thought. Both wax eloquent over the success they have been able to achieve, by either being *tough* with the worker or by adopting a liberal and conciliatory attitude. The nearest analogy is to the differing approaches of a strict and disciplined father, as against a kind, indulgent and patient father, in bringing up the child. They both claim magic results, and we know very well how both types, under peculiar environments, have produced juvenile delinquents. Similarly, in handling industrial relations, both the approaches have their merits and demerits, depending very largely upon the environment or climate under which either method is tried out. I know of cases where an enlightened and benevolent attitude has been misinterpreted as a sign of weakness and has created an unending crop of industrial strife at the hands of an irresponsible union. A famous Indian trade union leader once admonished me that the theory of sparing the rod and spoiling the child holds good in the industrial field, as well as in the class room. He told me that misplaced kindness on the part of the management and laxity of discipline tend to spoil the mentality of even a good worker. On the other hand, instances of unimaginative and harsh approach by management abound in the industrial life of India, and have often provoked good workers to adopt an irritatingly destructive attitude through frustration. Whatever may be the merits or demerits of either approach, it would be sheer folly on the part of an employer to launch out into a negative punitive policy, without having given a fair trial to a positive, enlightened and benevolent approach. Multiplicity of unions and inter-union rivalry sometimes make a mockery of such rational approach, because some of the trade union leaders attach higher priority to the claims of union ascendancy than to the ultimate interests of the worker.

I am happy to refer to a recent trend in labour-management relations in our country. We are, in a limited way, trying to introduce a scheme of Participation of Labour in Management. This is an experiment which should be tried out sincerely by both parties. The basic idea behind the move is to make the workers feel that they belong to the Organisation and are part of it. We have not reached a stage in which management and trade unions are ready to support the move wholeheartedly. It is understandable that there are legitimate mental reservations on both sides. All I can say, at the moment, is that any progress that we may be able to achieve in this direction will go a long way towards strengthening the means of communication and bring about improved relationship between the employer and the employed.

What does Management expect from Labour? Let us enumerate briefly: (i) a fair day's work for an agreed wage (ii) performance of the assigned work in an efficient and faithful manner. If a worker is represented by a union, then that union should promote and encourage such efficiency (iii) loyalty to the enterprise, its owners and management (iv) a genuine interest in the prosperity and growth of the enterprise, so as to be assured of continuity of employment and better rewards with increasing prosperity (v) an obligation to hon-

our any code of conduct or discipline which governs his contract of service.

What does Labour expect from the Management—(i) a fair wage in relation to the prevailing standard of wages (ii) a remuneration which should not only ensure his survival, but should be able to provide him with amenities of life, consistent with the national standard of living (iii) security of employment and immunity from arbitrary dismissal (iv) a fair and just treatment during the contract of service (v) working conditions as prescribed under the Factory Act for his health, well-being and safety (vi) recognition of his merit in the form of reward and promotion (vii) tangible appreciation on the part of the employer, his managers and supervisors of the good work done by workers (viii) issue of instructions, orders, warnings in a manner which will not conflict with the worker's self-respect.

What does Loyalty to the Enterprise and its Management mean? In trying to define the workers' loyalty to the enterprise, one finds that the area and scope widens as we probe into this subject. It could, however, be enumerated briefly as follows: (i) general acceptance of the objective and policy of the enterprise in-so-far as it has been communicated to him through various channels of communication between the management and the workers; (ii) acceptance of the procedure, regulations and rules governing behaviour as indicated in the standing orders and in various codes of conduct and discipline in vogue in industry; (iii) acceptance of production methods, techniques and standards of quality control etc.; (iv) respect for the sanctity of agreements arrived at between the management and recognised unions representing the majority or a large section of workers; (v) acceptance of the right and responsibility of management to conduct an enterprise and recognition of the supervisory and managerial staff as members of management; (vi) care and consideration for stores, equipment and machinery and other assets of the enterprise.

In considering the question of loyalty of the worker to the management, one cannot ignore the factor of dual loyalty of worker who happens to be a member of trade union: loyalty to his union and loyalty to the employer. Under the labour regulations in India, it is open to a worker to join or not to join a union. We ourselves do not believe in *closed shops*. The worker can join a union of his choice. This is a healthy feature of our trade union movement, as it provides immunity from union tyranny, both to the worker and the employer in the matter of the choice of union, and thus, their discretion remains free and unfettered.

So long as unions are of a responsible variety, it is our experience that the workers' loyalty to the union is a very healthy feature and needs to be encouraged. In so far as we are wedded to the principle of collective bargaining, every effort should be made by the employer to ensure that the worker's allegiance to some union is encouraged and maintained, which would ultimately pave the way to its recognition, as a bargaining agent, by an industry or an establishment. It is indeed a pity that, very often, employers find themselves in a difficult position where, owing to plurality of unions or for want of a sufficiently representative union, recognition becomes a difficult process. Enlightened employers, who believe in collective bargaining, have always supported attempts by the State to encourage recognition of unions, even with a bare minimum of 15% membership, as laid down in the Code of Discipline. It is through such process alone that one can hope for the establishment of a healthy trade union movement in the country. It would absolutely be wrong to say,

that, in all cases, the workers' loyalty to the union is in conflict with his loyalty to his employer. Both are engaged in a common task to their mutual advantage. It may even be said that the union is interested in high profits, because it would ensure higher remuneration and stability of employment. Subject to capacity, the employer too would be glad to pay higher wages, because he can secure an efficient and contented labour force. The conflict, if any, emerges only when an illegal lock-out or strike followed by violence or intimidation takes place. Thus, it can happen only as a result of violation of the basic principles of industrial relations, either by a worker or by an employer which would create an impression of conflict of interests. In the larger interests of his unit, an employer would be better off by dealing with a strong representative union capable of delivering the goods, rather than by dealing with a multitude of workers belonging either to no union or several rival unions.

It is a well known fact that some of the difficulties experienced by underdeveloped countries in the matter of maintaining good industrial relations are due to workers' ignorance of trade union practices. It is a matter of gratification that the Government of India, in cooperation with the Ford Foundation, have evolved a scheme of Workers' Education which has been put into effect during the last 3 years. The object of the scheme is to make workers trade union conscious, and to educate them in the principles and techniques of trade union organisation. This is a move in the right direction and deserves the whole-hearted cooperation of the trade union leaders in the country. I am confident that, with such efforts, our workers will, over a period of years, be able to find a larger number of leaders from within their own ranks.

One feature which sometimes creates serious difficulty to an employer in the matter of dealing with the unions is the legal status accorded to an industrywise union which enjoys a blanket cover over the entire body of workers in that industry, regardless of representation of that union in several individual units. Here, the employers' position becomes extremely difficult, because he may have to negotiate and come to terms with a union to which his workers are not affiliated, because of the statutory recognition given to that union *vis-a-vis* that particular industry. Under such circumstances, there is a likelihood of an employer coming into conflict with the union, despite the fact that he may have very cordial and happy relations with his own workers. A situation of this type has often retarded the efforts made by the State and employers to encourage participation of labour in management and introduction of well-intentioned schemes of rationalisation which, in normal circumstances, can be easily put through, if only the industrywise recognised union had a hold on a substantial number of workers in all units of the industry. Whilst in the context of State regulations, this situation has to be tolerated, a time must come when the recognition of an industrywise union must be subject to a certain minimum representation at each unit level, if the philosophy of collective bargaining and happy industrial relations is to be implemented to the fullest extent.

In a highly competitive era of rapidly advancing techniques, no nation with an eye on export can survive except through maximum of production at a minimum cost, resorting to intensive use of machinery and achieving higher productivity of labour and managerial efficiency. In such a scheme of things, the worker has an important role to play along with the managerial staff in preserving the existence of the unit in which he is employed. He can make his

vital contribution through increased productivity. He is in control of his own destiny, having an opportunity to earn more through better workload and higher productivity. So long as such increase in productivity does not result in retrenchment, the union cannot and should not oppose schemes of rationalisation of production. The Indian employer is committed to rationalisation of labour without tears, and to that extent there is no danger to the employment potential. Here is an excellent opportunity for the worker to share the gains of higher productivity, at the same time to serve national interest in making Indian industry hold its own on the international market.

India has indeed a very good record of dealing with industrial labour problems bearing in mind the very short period of her industrial progress. This happy position has been rendered possible due mainly to three factors: consciousness on the part of Government to protect the worker from exploitation through various legislative measures; enlightened leadership noticeable amongst a growing number of employers in the country who believe in sound and progressive industrial relations; growth of a healthy national influence in the trade union movement under the guidance and direction of Mahatma Gandhi, who instilled and inculcated his basic principle of solving all differences through peaceful and non-violent means.

TRUE UPTO A POINT

Nothing is all black or all white. No human being is all bad or all good; no work group is completely efficient or completely inefficient; no method is the one "best" way or the one "worst" way. Yet, in spite of this, most people have a dangerous tendency toward either-or thinking. They say to themselves: this group of men is either efficient or inefficient; I am either a success or a failure; a man is either a sound thinker (that is, he agrees with me about everything) or he is not. In other words, most people fail to think in terms of degrees.... A similar pitfall is all-or-none thinking: One either agrees with everything the president says and does, or one is not a loyal party member; all government agencies are full of incompetent, wasteful bureaucrats; or all government agencies are models of perfection.... The cure for either-or and all-or-none thinking is continually to remind ourselves that few, if any, values in this world are absolute; they are a matter of degree. With practice, one can acquire the habit of thinking "such and such is true upto a point."

Fundamentals of Productivity

Production Engineer's Point of View

M M LUTHAR[1]

Productivity implies a balanced use of a given combination of space, materials, machinery and plant, and men so that manufacture or repair of any item can be carried out at the least cost.

MANUFACTURE or repair of any item involves a certain basic work content, which is not capable of reduction; over and above this basic work content, however, the work done to manufacture or repair an item includes some excess work content, which lends itself to reduction by various means. Any attempt to increase productivity, therefore, is fundamentally a question of reducing the excess work content.

The excess work content is generally a result of one or more of the following factors: (i) Defective design and/or specifications (ii) Inefficient methods of manufacture (iii) Shortcomings of management (iv) Ineffective time within the control of the worker.

The extent to which low productivity can be attributed to defective design or specifications generally becomes apparent only through experience on the shop floor. One of the best methods to improve designs or specifications is to offer an incentive to the workmen and supervisors to put forward their suggestions and then sifting them to judge their practical value. Excess work content due to defective design or specifications can be further sub-divided as under (i) *Design leading to uneconomical process of manufacture or repair*: Very often designs for components are made without due consideration of the process of its manufacture or repair. The design office must have a very close liaison with the workshop and should, if possible, be located within the workshop. All new designs should be approved by the manufacturing and repairing shops before they are finalised. (ii) *Design leading to uneconomical use of materials*: Designs of components are often made to be on the safe side involving more material and consequently more work and higher cost than another design which can meet the requirements equally well (iii) *Lack of standardisation* results in a larger number of components being manufactured[2] and repaired than may be neces-

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[2] Standardisation in industry may easily be compared to culture in society. Just as civilised behaviour regulates social intercourse of man and his intellectual and cultural life is enriched by his appreciation of cultural values, so does standardisation help to regulate the conduct of commerce and industry in a smooth and efficient manner.

sary, introduces more set-ups on machines, complicates production control and thereby increases working expenses. Designs must take into account standard sections and standard materials and where assemblies are concerned, standard components. (iv) *Incorrect quality standards, causing unnecessary work*: Sometimes without adequate consideration, the design office indicates a high degree of finish on components, which without any loss of properties or usefulness could do with a slightly lesser degree of finish, saving considerably on the cost of manufacture and repair. (v) *Inefficient methods of manufacture/repairs*: In almost every workshop relatively inefficient methods of manufacture account for a substantial loss of effort and manpower. An analysis of the methods of manufacture can be made under the following heads—(a) *Wrong methods due to lack of process planning*: Very often, machining operations do not take into account the optimum capacity of the machine or the extent of its suitability for a certain type of work. Even a very rough check of the suitability of the machines for the work done on them on any day would be revealing. In the first instance, machines should be rated and clearly specified for each operation. Study of machines should also include the design of equipment in so far as it results in increasing movements. Proper positioning of controls, for example, may save a lot of *to and fro* movement of the operator. (b) *Incorrect Operations*: Methods of work used are generally those which have been handed over from one workman to another, representing a habit rather than a scientific approach. Thus inefficient methods continue to be employed till the workman on account of his own ability improves the method or the smart supervisor finds that he can improve the outturn by a change in the methods. Operations must be studied and laid down in a *process sheet* in a manner which cannot be misunderstood.

Shortcomings of Management: While defective designs and specifications or inefficient methods of manufacture can be *broadly* termed as shortcomings of management in the sense of faulty direction, there are certain other factors affecting productivity, which are directly controlled by management. Their intelligent appreciation could very considerably reduce wastage of time and effort—(i) *Bad planning*: It is necessary to plan the work in advance to ensure maximum utilisation of men and machines. Proper planning can, of course, be done only if the management has an accurate idea of the time required for the operation to be planned by work measurement. Good planning, of course, means a lot more. (ii) If work has not been properly planned in advance according to technical possibilities and market demand, it may lead to *frequent changes in design*. This often results in processed material being thrown into the scrap heap and involves besides the loss of material, loss in production capacity. In addition, design changes also affect the efficiency of the workshop because the workmen who have been used to doing the job in a particular manner have to get used to different methods and different items, and it takes them sometime before they can achieve their maximum efficiency, on the new jobs. A record of the drawings superseded or design changes with reasons thereof subjected to a review, say, every six months, may result in a change of policy regarding changes of designs or perhaps changes in personnel doing design work. (iii) *Lack of raw materials*: Once the work load has been determined and material required known, it is essential to ensure that the raw material will be available at the right time, simultaneously keeping in mind, that stocks of raw materials in the stores depot are not so high as to result

in unnecessary locking up of capital. (iv) *Plant breakdowns*: A close study of a record of the items or components of machine tools giving repeated trouble would enable one to conclude the time that elapses between the failure of the various components and the parts that giving repeated trouble. If replaced before they actually fail, it would result in substantial saving of idle machine time. Alternatively, this record may lead to changes in the design of parts, prone to failure. A minor schedule covering all the wearing parts once in a year carried out on the machine in site and a periodic overhaul every ten years by a complete reconditioning the machine would not only go a long way in reducing plant breakdown but also save the management some capital which would otherwise be spent on replacements. Uneconomical working, particularly with rapid strides in machine tool engineering, sometimes makes a machine outdated. It is cheaper in the long run to replace it by a more efficient machine which may even require less labour. In spite of preventive maintenance and schedule of repairs, there comes a time when the machines are beyond economical repair. Retention of these machines is an unwise measure. (v) *Accidents*: Even a cursory examination of accidents occurring in any workshops would perhaps indicate that there are certain places and certain operations where accidents are heavy and the loss of man or machine hours in such cases needs a thorough investigation.

Productivity of any organisation depends to a large extent on the working conditions. The factors which should receive consideration for improving working conditions are given below. (i) *Cleanliness* in any workshop, though costing relatively very little, is a fundamental requirement for ensuring the health of the workman and improving the productivity of the unit as a whole. (ii) Lack of sufficient *lighting* will result in waste of materials, besides accidents and damage to the health of the workmen, especially if the work done is of a fine nature as in a Tool Room. (iii) Increased comfort at work will improve efficiency of the workmen and good *ventilation* affects the comfort of the workmen in no small measure. If adequate natural ventilation is not available, it must be supplemented by artificial ventilation, and if necessary, even airconditioning. In the case of operations which result in fumes and vapour being generated, it is necessary that they should be removed quickly and efficiently. Examples of such places are white metalling plants, galvanising plants, smith shops and operations involving electro-chemical reactions. (iv) Suitable *colour* given to the walls and machines can add to the harmony of working and result is some increase in productivity. (v) Unnecessary *noise* jars on the ears, causes fatigue and affects productivity. Any work which involves thinking processes must be as much removed from noise as possible and sound proofing provided for very accurate work. (vi) Congested *work places* affect the quality as well as the outturn of work and in order to do good and efficient work, the worker should be able to move his limbs freely and also have enough space for proper stacking of raw and finished materials. Consistent with the type of work being done by him, he must be made as comfortable as possible, and if possible provided with a seat to reduce fatigue. (vii) Wrong *tools*, as a factor affecting productivity, rarely get enough attention. While an average supervisor uses all his energy in concentrating on the quantum of work to be done by the workman, he rarely gives his attention to the tools that the latter has been provided to carry out the work allotted to him. In this context it would be useful for every supervisor to make a spot check of, say, 10 tools used by his men every day.

(viii) *Bad layout*: Examination of the flow of material or men frequently reveals that a lot of movement could be avoided by reorientation of the process or re-positioning of some machine tools. In the latter case, it would be necessary to carefully work out the return from shifting the machine or machines and to ensure that it is sufficiently high and sustained to justify the expenditure on uprooting the machines, shifting them to a new site and then re-erecting them. Weight or size of the product is important in this context and if the material is heavy, its movement must be kept to the minimum. Similarly if the operations are such that a large number of people from various sections are involved, the workplace must be so located as to reduce the overall movement of men as far as possible.

Frequently working methods, especially for repair operations, are not the ideal ones. Due to lack of either confidence or knowledge, the worker adopts methods which have been followed by either a colleague or his predecessor or in the case of families of craftsmen, by the elders in the family. This obviously restricts the scope of any process planning and sound technical training is essential to get the maximum benefit of sound planning. It is a good move that the Ministry of Labour has opened two schools for training of instructors in the methods of imparting both practical and theoretical knowledge.

Inspite of all the efforts of the management the attitude of the worker can keep the productivity at a lower level than the management would like to have. The worker is directly concerned with the following factors affecting productivity — (i) *Absence, late attendance and idleness*: Besides a sound personnel policy which can create interest of the workers in their day-to-day work, a fair scheme of payment by results will go a long way in remedying these causes of low productivity. (ii) *Accidents*: While mention of accidents has been made under the head 'shortcomings of management', there are, however, accidents which are within the workman's control, and occur just due to his carelessness. It is necessary to educate the workers in the means that can be adopted to avoid accidents. (iii) *Careless workmanship*: Careless working resulting in waste is almost entirely within the control of the worker. Although sound training schemes may help to avoid loss of productivity on this account, a more direct approach is the introduction of a system of 'payment by results' with a proper inspection organisation.

More important, however, for improving productivity, is the right kind of *work study*. It embraces the techniques of method study and work measurement, which are employed to ensure the best possible use of human and material resources in carrying out a specified activity. There are two important steps which have to be followed before carrying out any work study: (i) selection of the work to be studied (ii) defining scope of study. Considerations which have to be taken into account to make a selection of the items to be studied, can be economic and/or technical considerations and human reactions. The *economic considerations are* (i) regular bottlenecks, resulting in appreciable loss of man or machine power (ii) priority of items to be brought under incentive (iii) operations involving relatively more manpower and equipment (iv) in almost every workshop, rationalisation of internal transport and intelligent placing of feeding points, besides reducing handling of materials, help to reduce the time taken on manufacturing or repairing processes (v) requirements of some items may be so heavy and so frequent that even the slightest saving in the time taken may ultimately yield

big results, depending on the time saved and the quantity produced.

Technical considerations: In a machine shop, a close study of machining operations frequently reveals that the speeds and feeds actually used are not the optimum for various types of materials. Another important place where method studies have been known to reveal possibilities of savings is the correct use of furnaces. In this case the study should include the design of the burner, the type of oil used, the design of the furnace in general and its suitability for the material to be heated in particular. No doubt, a large number of other examples can be cited, where technical considerations would claim an important place in the determination of priorities of items to be studied. These would, however, vary with each workshop according to the type of work done.

Human Reactions: Frequently human reactions are ignored before embarking on extensive work study in the plant resulting in unnecessary estrangement of labour relations. Almost every aspect of work study has an immediate effect on the worker. His work is closely examined during studies and he may be asked to change his long established method of working or the layout of his place of work may be altered. It is essential to appreciate the importance which must be given to giving frank and full answers to all the questions from the staff concerned even if they appear to be superfluous. The foundation for successful application of the work study is the workers' confidence that the management is fair and just. Any work study scheme not supported by their willing acceptance is doomed to fail to achieve its objectives.

Next perhaps to losing life, the workman's greatest fear is losing his job. If work study is presented to the men in a way, which will have the effect of putting some of them out of employment there will be immediate opposition and perhaps collective resistance. Retrenchment of staff consequent on the introduction of work study should be avoided and any increase in productivity should be catered for by increasing the work load in preference to reducing the staff strength. To do this, it may, in cases, be necessary to change the trade of some men after proper training.

Another thought that frequently upsets the staff is that whenever work study is carried out, and particularly where incentive schemes are to be introduced, they will have to work considerably harder to earn bonus and in some cases to the detriment of their health. Although it is true that work study implies greater output the important point to bear in mind is that work study obtains results through better planning and improved methods and layouts and higher productivity does not mean necessarily a corresponding increase in the effort of the worker and certainly does not involve any ill effects on the health of the workman. In fact the fundamental principle on which work study is based, is that no matter what the job is, 'norms' set by the management must only be such that an average worker, working under incentives, should *not be more than healthily tired* at the end of his normal working day. With this background, it is best to introduce work study, in the first instance, in places where the advantages of work study to the labour can be easily shown, and this is more effective than any amount of propaganda or lecturing by the management to the labour representatives to convince them of the practicability and usefulness of work study and increased productivity.

It is quite common for management to just appoint Rate Fixers or Method Study Engineers and ask them to improve the working methods and to

arrive at the time required for all operations carried out in the workshop. *It is for the studying personnel to ensure before they start their job that they know precisely what they are required to do.* With the managerial staff frequently having little time to go into these details, they would save themselves infructuous work and embarassing situations, if they define the aim, purpose and scope of the study and get it approved by the manager.

PART II

Method study has been defined as the systematic recording, analysis and critical examination of existing and proposed ways of doing work and development and application of easier and more effective methods with the object of reducing the work content by improvement of processes, layouts and reduction of fatigue, so that the best possible use is made of a given combination of space, materials, machinery and plant and manpower. It involves: (i) recording of existing practices (ii) examining the facts critically (iii) developing and defining an improved method (iv) installing and (v) maintaining the new method.

The record of existing practices is the foundation on which the edifice of method study has to be built. It is necessary to appreciate that the intentions to improve the exising methods may well be nullified by inaccurate or incorrect recording of facts. The record may relate to the plant layout or the workplace. Process charts and/or multiple activity charts and/or flow diagrams may be used to study layouts. Process charts may be operation process charts or flow process charts.

The operation process chart is a "graphic representation of the sequences of all operations and inspections involved in a process or procedure in which the entry points of the material are indicated". It is meant to give an overall view of the process and is only a preliminary step to finding out whether any further investigations in improving the method are justified and if so, their priority. The flow process chart on the other hand records, besides operations and inspections, the details of movements, delays and storage. Similar flow charts are used to record the movements of products, materials and men. *Multiple Activity Charts* are used to indicate the relative activities of either one or more operators and/or machines. There are separate columns for each man and each item of equipment and the chart indicates sequences of activities on a time scale.

Flow (line and string) diagrams: A 'line diagram' is a layout of the section or shop to scale, and lines are marked giving the paths of movement of men and materials. This type of diagram, however, can be most effective, if the movements are relatively few, because plotting of a large number of lines on the same paper may result in confusion. When the activities are large in number and are restricted to a small area, it is better to use a 'string diagram', which is also a layout of the area under study on which the movements are recorded by fixing pins at various points to which the men or materials travel and joining them with strings. Different colour strings are used for marking paths of different components or different men and the total distance covered is arrived at by measuring their length. *Models* are also used to study the layouts of sections or shops and give a more realistic picture than the diagram. Strings can be used on models for tracing the paths of men or materials.

The means used for recording facts at the work place are one or both of the following: (i) two-handed process charts (ii) micro-motion study and

simo charts. The first is limited to recording the chronological movements of hands and limbs of the worker. The micro-motion study is based on the activities being divided into 17 elemental movements: search, select, grasp, assemble etc. known as therbligs (reverse of Gilbreth who conceived the segregation of the elements of movements). They are plotted on a simultaneous motion cycle chart, commonly known as SIMO CHART, drawn to a time scale, time being recorded in 'winks'. (1 wink = 1/2000 of a minute). In view of the elaborate arrangements required for micro-motion study, a careful assessment of the need for going into such fine details should be made before embarking on it.

The examination of recorded facts must follow a logical sequence, and includes *challenging of the purpose of work done*, place or work, sequence of operations, person/persons performing the operations and the means of carrying out the job. The examination of the facts and challenging the purpose, place etc. must be carried out with the basic idea of either eliminating an operation altogether or simplifying it so that it is the most economical under the circumstances.

The defining of the improved method follows development of the improved method after a detailed examination of the existing one has been completed, taking into account, proper planning and control, materials handling facilities, general environment and working conditions, plant layout, economical aids for various operations, instructions to be imparted to the workman, equipment designs and jigs and fixtures. In actual practice, when major changes are involved, the method study engineer would do well to consult the shop supervisors before finalising it. This is necessary not only to ensure that all the practical aspects have been covered, but also to put the supervisors in a proper frame of mind for implementing the changed methods.

Installation of the improved method calls for a tactful approach. Old habits die hard and it is no use being just strict and forceful in breaking them. The men must be convinced of the efficacy of the improved methods, if necessary by demonstration. An atmosphere of amicability and mutual faith between the administration and the staff is essential to achieve the best results. As the final step in the completion of a method study cycle, it is necessary to check at intervals that the improved method is being followed.

Method study is only one of the steps which can improve productivity. It, however, has its limitations. It does not, for example, help very much in spotlighting ineffective time spent in performing various jobs and it does not indicate the quantum of work that should be expected from every individual in a given length of time. This is achieved by *work measurement* which may be defined as "the determination of the proper time to be allowed for the effective performance of a definite task carried out by a specified method." *Effective performance* means that "the task is carried out at a maintainable level of performance according to an approved method in which the required standards of safety and good practice are observed and from which the required quality results".

Work measurement serves the cause of productivity in many ways. It (i) enables utilisation of available labour in proportion to the quantum of work to be done (ii) assists in making an accurate assessment of the available staff and plant capacity and thereby helps in (a) planning and production control (b) balancing available capacity (c) working out future requirements of

staff and machinery and plant (iii) allows accurate costing to be done, and (iv) serves as an equitable basis for fair incentive schemes.

The steps involved in Work Measurement of a selected job for which the method has been prescribed, are as under: (i) defining the job to be done (ii) breaking the job into elements (iii) selection of the technique of work measurement and compilation of allowed time and (iv) implementing the allowed time.

Breaking jobs into elements

It is not possible for any person to work continuously at the same pace and the pace not only varies from one cycle to another, but also within the cycle itself. In the case of machining operations, the fixation of time allowed depends mainly on technical considerations like optimum speeds and feeds and tool layout and it is relatively easy to calculate the norms. In other cases, for example, smithy and forge work, foundry work, repair jobs etc, it becomes necessary to 'rate' the operator over short periods of productive time. This is done by breaking the job into productive and unproductive elements which are constituents of the job with a clearly recognisable beginning and end. It is usual for elements to have a duration of 10-30 seconds. Below 10 seconds, besides there being generally no variation in the pace, it is difficult to read and record times accurately, whereas for periods over thirty seconds, the possibility of change of pace during the element becomes a definite probability.

Work can generally be classified as either repetitive or non-repetitive. The repetitive work includes operations or processes for which the methods employed as well as the work content remain constant. The techniques employed are (i) *Time Study* in which the time necessary to carry out the work to the required quality is determined from a limited number of observations. This is applied only to repetitive work. (ii) *Synthesis* in which time standards built up from elemental time previously obtained from direct time studies are used to work out the norms. These time standards are referred to as synthetic times, synthesised time standards, basic data or standard data. This technique is applicable both to repetitive and non-repetitive work. (iii) *Analytical estimating* in which elements of long duration are estimated for the time they require by a person possessing intimate knowledge of the work. This is applied only to non-repetitive work.

The technique of work measurement carried out with the help of a stop watch is the one most extensively used and can be conveniently dealt with under the following heads: rating, carrying out a time study, determination of allowances and compilation of allowed time. The basis of time study lies in rating, that is, the assessment of the *speed and effectiveness* of the operator with relation to a preconceived normal speed and effectiveness. This normal pace of working is one which an adequately trained and experienced worker with normal intelligence and physique can maintain, under capable supervision, throughout his working period without feeling more than reasonably tired at the end of the period.

There are three scales of rating in vogue 60/80, 75/100 and 100/133. The former figure in each case represents the "normal performance," that is, the pace of working of an average worker under non-incentive conditions; and the latter figure represents the "standard performance," that is, the pace of working of an average worker under incentive conditions, being 33% more than the normal pace.

Normal performance for each element is represented by 'normalised time', which is observed time x observed rating/normal rating.

The steps involved in carrying out a time study are (a) getting the cooperation of the foreman and the operator (b) recording elements (c) recording details of the job, that is, operation tools, materials, jigs, fixtures, gauges, quality requirements etc. (d) recording time for each element (e) recording the rating of productive elements (f) repeating the study.

The number of cycles to be studied is determined after consideration of the amount of variation in the quantum of work in various cycles and the manhours spent every month on the same job. The more the manhours the greater is the need for accuracy by taking a relatively larger number of studies.

The allowances generally given are fatigue allowance, contingency allowance and gauging allowance—(a) *fatigue or rest allowance* provides for the energy expanded during the productive portion of the job; also caters for the personal needs of the operator like going for a cup of tea or to the lavatory. The allowance is given as a percentage of the normalised time and is generally between $12\frac{1}{2}$ to 25%. (b) *general handling and contingency allowance* covers the periods of enforced idleness, taking instructions, regrinding tools, cleaning of machines, also inspections. (c) *gauging allowance* is provided for only those jobs which have to be prepared to specified gauges. Generally 5% is allowed.

The allowed time for each element is worked out by providing for the rest allowance on each individual element and the allowed time per piece is worked out by adding up the allowed time for all the elements and then providing other allowances on the total.

Synthesis: In the work done in workshops, there are generally a large number of elements which are common, and synthesis involves the use of basic data, that is, the allowed time once established for them with the help of time study or in the case of machines from certified charts of speeds and feeds. The main advantages of work measurements by synthesis are (i) 'norms' can be set more quickly and accurately and hence cost less (ii) they are consistent and have the obvious advantage of creating a favourable impression on the workmen, when the administration tries to convince them of the need to improve productivity (iii) standards can be set before the jobs start.

Analytical estimating: Synthetic data can be used for non-repetitive work but only to the extent the elements are repetitive. Other non-repetitive work has always presented a problem to the industry in the matter of work measurement. In these cases the job is broken down into elements and where possible the normal time is given from basic or synthetic data. For the remaining elements, the normal time is estimated. It is obvious that the estimator must not only have a thorough knowledge of other aspects of work study, particularly 'rating' but should also possess extensive experience of the jobs that he estimates. After the normal times have been worked out allowances are added as in the case of time study to arrive at the allowed time.

To complete the records before the allowed time is issued, the work to be done must be made clear in all aspects. Vagueness in describing the job results in disputes and the following should be clearly mentioned (i) description and drawing number of the component (ii) raw material used (iii) description of

the machine and its plant number (iv) speeds and feeds used (v) jigs and fixtures used (vi) description of work and sub-operation number if it forms a part of a process (vii) quality required, including gauges to be used (viii) grade of labour required, whether highly skilled, semi-skilled or unskilled (ix) stages of inspection (x) detailed description of work showing direct and indirect elements, setting-up time etc (xi) details of allowed time, that is, normlised time and allowances (xii) procedure for dealing with ineffective time.

The psychological reactions of the staff are often ignored when the allowed times are issued. Issuing of allowed times in a sense is a culmination of the efforts of the work study men and it is largely on their successful working that the extent of increase in productivity depends. Almost invariably in workshops which have not had work study carried out in their shops, the actual time taken on production is more than the allowed time indicated by the various techniques of work measurement. The reason may be wasteful operations, cumbersome methods or simply, inefficiency. But, before the allowed times are issued, it is absolutely essential to convince the workmen as well as the shop supervisors that the quantum of work asked for in a shift from the men is fair, will give them adequate rest and caters for their personal requirements. It is at this stage that the fears and doubts in the minds of the men about the applicability and fairness of the allowed time have to be allayed. To those who can understand, the details of allowances given must be explained to the workmen. The person who has to get the work done to the revised targets is the shop supervisor. He must be fully in the picture of how the times have been worked out and before issuing the time to the workmen, he must satisfy himself about the workability of the time.

Production planning, generally speaking, is planning of the programme of work against a time scale, while production control may be defined as "control and coordination of the movement of materials, performance of machines and operation of labour as to quantity, time and place to ensure the fulfilment of a predetermined programme." The functions of planning and control in a production organisation are so closely linked that frequently they overlap and it is difficult and to a certain extent incorrect to draw a very rigid line between them. In most concerns, planning and control form one department. This is as it should be because of the close liaison that is necessary between all the persons engaged in planning and controlling production.

Method study and work measurement give us the basis to improve productivity for individual operations. Lack of planning or controlling the performance of individual operations as a part of an overall programme will result in confusion, idle men and machines and delay in completion of orders. Productivity of a concern as a whole, depends a great deal on accurate planning based on work measurement and then taking steps to ensure that the plan is adhered to under normal circumstances and to create a system of dealing with emergencies which may threaten to upset the working of the plan.

The activities generally covered by Production Planning and Control are given on next page.

Incentive Schemes

All over the world a large number of incentive schemes introduced in different fields of industry have failed at a fairly early stage for want of sound preparatory work. The essential prerequisites to the introduction of incen-

Production planning

1 planning work in economical batches
2 scheduling or planning work in various sections/shops to a dovetailed programme
3 initiating purchase of parts/components
4 standardisation of operations
5 cost estimation of new jobs undertaken

Production control

1 despatching, including issue of factory forms and procurement of raw materials
2 production records
3 expediting items under manufacture/repair
4 expediting purchase items
5 idle machine analysis
6 internal transport

tives are: (i) method study (ii) work measurement (iii) production planning and control (iv) implementation of allowed times (v) inspection organisation. The importance of these functions in the context of introduction of incentive schemes is briefly outlined below. Their theoretical aspects have already been analyzed.

If incentive schemes are introduced without methods being properly studied, the management will frequently find itself in the position of having to pay for each operation more than is financially justifiable. The main cause is a gradual improvement in the methods on the shop floor, brought about by the workmen when incentives are introduced. Particularly when the maximum bonus is limited, the worker has a tendency to improve his method of working to enable him to earn the maximum bonus and then relax. The incentive scheme must however contain provisions for compensation to be given to workmen who suggest improvement in methods resulting in increased productivity.

Work measurement is essentially a means to arrive at a yardstick of human effort and to find out what should be done by the individuals in a given length of time to a specified quality. It is frequently applied in workshops even without introduction of incentives in order to improve productivity. Once work measurement has been done on a sound basis, however, it would pay both the management and the workers, if a fair scheme of payment by results is introduced. Time studies, in particular, prepare the workers psychologically for incentives and also provide a sound basis for carrying out proper investigations on the allowed times in cases of disputes. A feeling of fair play and justice among the workmen must, however, be created, explaining to them details of how work measurement is done and also how allowances are made for fatigue, his personal requirements as well as variations in his work before introducing incentives.

The value of work study in the context of incentive schemes can be lost to a great extent, unless it is supported by a proper system of production planning and control. Frequent non-availability of raw material or of partly finished material for work at a particular time resulting in non-fulfilment of commitments, for example, will make any incentive scheme unworkable. If there is excessive idle time of men or machines for any reason, the benefits of incentive schemes will only be on paper without producing any financial results. It is, therefore, essential for the success of

incentive schemes that for every job tackled a proper plan is made out, targets set and steps taken to ensure that the progress of work is controlled in a manner which will ensure compliance with the targets.

Inspection organisations in workshops working under non-incentive conditions are generally inadequate and they have to be considerably enhanced with the introduction of incentives, to ensure quality control. They should be put into action, at the latest, simultaneously with the establishment of allowed times. A workman, who is not used to getting his outturn inspected suddenly faced with the prospect of heavy rejections in the work done by him and his having to make up for the rejections, is not likely to be happy about it. A tactful approach is obviously necessary if the scheme has to succeed.

In organisations having large labour strength, it is advisable to introduce incentives step by step, say one section or sub-shop at a time, so that both management and labour can study their effects. A number of snags will arise and it is only proper that these are dealt with in one section or a shop at a time rather than in the entire workshop, in which case the difficulties may easily become unmanageable and foredoom the success of incentive schemes.

It is also generally recommended that the workers should be advised of the bonus that they have earned as early as possible and if practicable, on the day after they have earned it. In all workshops there are staff who are indirectly engaged on production like supervisors, unskilled staff and staff utilised for handling cranes etc. It is usual for such staff to be given incentives based on the average percentage of bonus earned by the direct workers.

In the ultimate analysis a constant review of the working of incentive schemes must be made to ensure that they successfully sustain the achievement of their main objectives which are: (a) improvement in the quantity of output to a specified quality at economical cost (b) reduction in idle time (c) reduced direct supervision (d) reduction in absenteeism (e) development of more efficient methods and (f) development of a team spirit between the workers themselves on one hand and the workers and the management on the other.

"You got to be tough with them!" said Starkey, "Remember those guys don't know ..... as far as these machines are concerned. When they tell me to speed up to about what I figure I can run the job, I start to take my apron off, and tell them, 'All right, if you think it can be run that fast, you run it!' They usually come around."

Developing Tomorrow's Managers

S H TURNER*

Based on real and personal experience, the thesis here presented has a somewhat unusual depth and significance, particularly in regard to making not only private but public organisations more productive than they are. The author does not claim to have found a complete solution, for the procedures and techniques for developing managerial skills are themselves evolving.

Definitions

A MANAGER means one who is responsible for supervising and integrating the activities of a group of people. He is entrusted with the implementing of company policy and the making of decisions appropriate to his degree of delegated responsibility. The higher levels of management participate in the formulation of policy. They include specialists, who, though they may supervise very few people, have an important influence on policy making by reason of the advice they contribute, based on their specialised knowledge and skill.

By *development* of managers is meant the whole range of activities designed to ensure that an organisation will have the right kind of managers in the right numbers at any given time. By this definition *development* consists of forecasting requirements, selection and promotion procedures in addition to the all-important processes of training and appraising the progress of individuals.

* Chairman, Hindustan Lever, Bombay

A growing need

During the last ten years the number of managers has markedly increased. So has the volume of business. The proportion of managers to the total number of all categories of employees has, in the author's own organisation, doubled during the last ten years, not because Parkinson's first law has been allowed to operate uncurbed, but because greater management strength has been found necessary to apply advances in manufacturing, marketing and accounting techniques to the benefit of the business. This increase in management ratio has long been proceeding in other countries. In businesses similar to ours in the more industrially developed countries of the world, the management ratio is as much as three times ours. In India the demand for an increasing number of managers may be expected to proceed at an accelerated rate from the same causes that are evident abroad. If we ignore this, our forecasting of management requirements will be vitiated. Superimposed on this demand is the far heavier one resulting from the rapid rate of industrialisation in the country.

If skilled managers are not forthcoming in the right numbers, industrial growth will be stultified just as surely as by inadequate capital resources. This influence is already at work in certain western countries, where the restricting factor is not lack of finance but an insufficiency of professional managers.

Faced as we are with this progressive demand for managers, we have to develop young men of potential, quickly. They will find themselves in positions of responsibility and authority at a relatively early age. It is industry's duty to see that they have as good a training as possible *today* to equip them for their task tomorrow.

Selection

Where do we get our managers from? Considering the shortage of suitable men and our incresing requirements, we have to draw on every available source. Our managers come to us partly by promotion from within the organisation, partly through training schemes and partly through direct recruitment to fill specific vacancies.

We attach great importance to promotion from within and do not fill a managerial vacancy from outside if there is suitable promotable talent inside the organisation. Promotion from within strengthens morale. We have learnt from experience, however, that we are never able to meet all our managerial requirements by promotion. Therefore we have found it essential to recruit young men of potential and to give them systematic training. Our training schemes operate in every sphere of the business: commercial, accounts, technical etc. A commercial trainee could perhaps be more aptly described as a general management trainee because he is intended to fill managerial vacancies other than in accounts, engineering and production departments.

A trainee is a young man, usually between 21 and 25 years, either straight from university or with very little business experience. Such a person requires 18 months to two years' training before he can be placed in a managerial position with full responsibility.

To fill specific vacancies when they arise, which cannot be filled either by promotion from within or from our trainee reserve, we recruit relatively older people who have already acquired administrative or managerial experience in other spheres. This is done also for certain positions which require highly specialised skills.

For want of space, it is difficult to describe our selection procedures in detail. We have a personnel department to assist us in selection. We apply various forms of testing. But the decision whom to engage ultimately rests with line management. The director or a senior manager of the department where the vacancy exists is always a member of the selection board. Recently we have tried including young managers in our trainee selection boards. It is good experience for them. Also, compared with more senior men belonging to another generation, *a young man may be at an advantage in assessing young minds.*

Training

After selection comes training. By management training is meant any activity undertaken to ensure that the manager who has selected will perform his function adequately and also develop his talents and abilities, so that he can progressively take on increasing responsibility. The author has not in mind only formal training courses.

Our organisation regards on-the-job training and learning by doing instead

...aching as the essence of good ...nent training. Other forms of ... within or outside the organisa... formal programmes, conferences, ...nars, etc., though useful, cannot be ...stitutes for the development that ...prings from practice.

What does on-the-job training mean? As a man does his job, he acquires knowledge and experience which, it can be reasonably expected, will make him a better manager in course of time. Quite obviously, experience of a job by itself is valuable and there can be no substitute for it, nor can there be a substitute for acquisition of knowledge and skill by an individual himself through his own initiative and unaided efforts. But on-the-job training means something more. It means the conscious and planned utilisation by a senior of the training opportunities provided by a junior's job to develop the junior's abilities and potential. In other words, on-the-job training is not merely the process of putting a man in a job and allowing him to learn what he can from it. It implies much more positive effort by the senior.

How can on-the-job training opportunity be best utilised? It is necessary first of all to accept that the person responsible for such training is the line senior. It is for him to judge an individual's weaknesses and strengths and to see how best the weaknesses can be corrected and the strong points developed through the job that a person has to do and the responsibilities that he is asked to bear.

A young man recruited for a management position should be given responsibility as quickly as possible with a minimum period of pre-training and familiarisation. How soon this can be done must depend on the job and the individual but the principle remains the same in all cases. As soon as possible during the period of training, a manager has to develop the habit of taking decisions. It is necessary to wean him quickly from dependence on his senior and from the habit of waiting for instructions before taking action. This kind of training has to be very carefully regulated. The area within which an individual can take decisions has to be defined so that he does not do anything by mistake which would do serious harm to the organisation. On the other hand, we must make sure that any limitations placed on his decision-making authority must be really justified. We must not let any undue anxieties on our own part prevent us from allowing him the freedom to make decisions and, perhaps, to make mistakes.

The question is often asked how much the technique of delegation can be manipulated to help the process of training. At a certain stage of seniority, the task of any manager is so well defined that the opportunity of varying the amount of authority that he can exercise becomes limited. At such levels all that can be done is to make sure that within the limitations indicated above, responsibility and authority are, in fact, delegated and exercised.

At earlier stages of development, particularly in the trainee stage, the amount of delegation can be constantly modified depending on the progress and rate of development. A good deal of nicety of judgment is called for so that, depending on the amount of initiative that a young man shows, the area of his authority can be expanded to ensure that his abilities are fully utilised and even somewhat stretched. At the same time we have to guard against imposing too heavy a burden on young shoulders.

It is also necessary, at every stage of development, particularly at the earlier stages, to ensure that supervision is not so close that the junior is denied the

opportunity of using his own initiative. A senior, very anxious about the welfare of his subordinate, can get into the habit of giving very detailed and precise instructions indicating a line of action in practically every eventuality so that his subordinate cannot make a mistake. Within limits this is a good thing but it becomes wrong if the habit is allowed to develop to a point where a young manager begins to look for a formula or instruction to deal with every situation that he has to face.

Besides using the day-to-day job of an individual to develop him, special assignments can be designed to broaden his experience, to familiarise him with different aspects of the business and also perhaps to correct weaknesses and to develop strong points. I have in mind measures like including managers in various forms of study groups and committees or allotting them *ad hoc* tasks. Suppose a senior level of management or perhaps the Board has to take a decision on a novel matter for which a particularly detailed examination of the proposition is necessary. In such an instance, it is often a good idea to form a group consisting of managers from different departments which is given the task of examining the proposition from every angle, finding whatever information is necessary and submitting their conclusions. This gives members of the group an opportunity of applying their minds to a task which is out of their day-to-day routine and which is done, not departmentally, but in conjunction with managers from other sections of the business. Similarly, when a task has to be accomplished it is a good idea to allot it to an individual or to a group of individuals and to ask them to complete the task, whatever it may be, within a certain period of time, keeping the senior level of management or the Board informed about their progress from time to time.

Including individuals in various committees is another way of broadening their experience and increasing their understanding of the process of decision-making.

While talking of training on the job, one should emphasise the need for rotation as a method of development. I am afraid this is something we have not tried very extensively in our organisation, but we have made a start. It is important to remember that, although transferring a person from job to job within the same function is valuable experience, the real effectiveness of job rotation as an instrument of training lies in moving people across functional lines.

Regarding selection for training, particularly in foreign countries, it is important to select carefully those that are seconded and to regulate their training in such a way as to prevent the training visits from degenerating into holiday trips. Before we recommend a manager for a training visit, his director has to indicate in clear terms the need for the visit, the results expected and the pattern of training required. Each director's recommendations are discussed at a meeting of directors. We strive to depute for training abroad only those managers whom we believe capable of development.

A valuable ancillary to on-the-job training is the more formal and organised programmes. These take two forms in our organisation. First, training conferences or programmes organised departmentally where the purpose is largely to impart knowledge about the specific functions of a department. Secondly, centrally organised courses which include managers from various departments. These courses are residential and last 3 weeks. The residential managers' courses are not designed to teach the specific functions that a

manager performs in the company. The object is to present to a participant a coordinated and comprehensive picture of the organisation showing how its various parts fit in a total pattern, how they are related to one another and how the different functions performed within the organisation converge to a joint objective. Residential training courses also endeavour to equip managers for certain general management tasks like tackling problems, making decisions and establishing and maintaining relations with others: in other words, to become better seniors, better subordinates and better colleagues.

Our residential training programmes have evolved slowly and, we would like to believe, realistically, in response to felt and expressed needs of the organisation.

We have experimented with various techniques and today depend essentially on three instruments of training: the case study and filmstrips, the lecture and the project.

The purpose of the case study is to bring about a comprehension of certain problems and their solutions which is not easy to impart through lectures, and to evolve certain general principles in the solution of managerial problems. In a case study no definite conclusion is expected to be drawn, the purpose being to emphasise that there may be more than one answer to a problem and what matters in managerial action is that a problem is approached analytically, on facts and in cooperation with others. This is the best available method for training in human relations. This aspect of managerial work is of paramount and pervasive importance because there cannot be a managerial problem the solution of which does not involve relationships in greater or lesser degree. There is so much jargon on this subject, so many meanings given to each term used, that to bring about an understanding of its implications and *nuances* by the use of words is impossible. It is only by discussions around real or near-real situations that it may be possible to bring about some understanding of its implications or, at least, of its importance.

Whereas it is right to say that there can be more than one answer to a problem, in real life a clear decision has to be arrived at and a choice has to be made from amongst a number of alternative lines of action. This is the purpose of the project. In a project a specific problem is tackled and the line of action recommended has to be presented to a group, supported by arguments, and defended.

The lectures are essentially informative and they fall into three categories: talks on company functions and activities, talks on various techniques and specialised functions, and talks on general topics.

Although we have now arrived at a fairly clear pattern of training, the details are being constantly modified. We have been increasing the proportion of locally written cases as compared to standard cases taken from text books or other sources. Although a case with a very definite bias has some advantage, I do not think it matters very much if we have to use cases written in other countries because the situations presented and the topics for discussion are usually similar to those found in this country. An increasing number of cases are being conducted by managers other than the Training Manager. As the pattern for leading case discussion gets established and as more managers become familiar with the technique, it is only right that more and more operating management experience and thinking are brought to bear on case discussions.

An essential feature of in-company training courses is the interest taken by

the topmost management. This should be visible. Our top management display keen interest and willingly devote time and energy in delivering lectures, participating in discussions and presiding over project presentations.

The development of a manager is a continuous process. He is the most important element in furthering it. We select the seed and provide what we consider is the best soil and climate for its germination and sturdy growth.

External Training

We think great value can be obtained by enabling our managers to undertake specific tasks for certain periods in organisations other than ours. This broadens their experience, brings them in contact with other people and other minds. We have not been able to apply this method nearly as much as we would like. But it is clearly a development method with great possibilities.

Courses conducted by various agencies outside the organisation have an important part to play. We use the Administrative Staff College at Hyderabad and also in a smaller way, courses run by the Administrative Staff College at Henley and the University of Harvard. We make fairly extensive use of courses and conferences organised by professional bodies like Management Associations.

The main advantage of extra-organisational training is that it provides an opportunity for our managers to meet people from other walks of life, to see contrasting ways of doing similar things and to listen to new ideas. It counteracts the dangers of mental inbreeding, complacency and parochialism. These are real dangers the consequences of which can be serious in a rapidly changing environment.

Useful as outside courses and programmes are, they can be seriously overdone, particularly when management training assumes the guise of a fashion and a large number of courses are being run by various bodies. The extent to which outside training is used has to be judiciously controlled and coordinated. It should be part of a total training effort and should fit into a total training design. Haphazard or occasional utilisation is not likely to be useful.

Pre-employment management education needs to be specially mentioned. There seems to be an increasing tendency for young men to go abroad just after graduation or after very little experience and acquire a qualification in business management or industrial administration. After many years of recruiting experience we have come to the conclusion that such a qualification offers no advantage over a good degree. Many such young men would probably have been better off if, instead of spending money and valuable time after graduation, they had found a job in a business house and acquired practical experience.

Let us summarise our thoughts on training. We believe that on-the-job training is most important. We welcome outside training courses as a means of cross fertilisation and a corrective for narrow parochialism, but we regard them as supplementary to in-company courses, tailored to the needs of the organisation. We also think that training cannot be really useful unless there is a training policy and a coordinated programme. Finally, development is a continuous process. Occasional or haphazard training efforts do not bear fruit. Unless training goes on for a fairly long time and takes place on a fairly large scale, results, in organisational terms, are not likely to be obtained.

Assessment of Training

Assessment of training is particularly difficult but we think it can be done in a

broad way. In this sphere, as in many other spheres of management activity, the main instrument of assessment is human judgment. We think that all training effort in the organisation should be under constant appraisal. We do it by various means.

In our residential managers' courses, besides the training manager and his staff, we like to associate managers from various operating departments for varying periods, sometimes for the entire duration of the course. This gives the operating department an opportunity of examining in detail how the courses are run and to assess whether they are likely to meet their training needs. At the end of each course there are appraisal sessions in which participants are asked to give their comments. Undue reliance should not be placed on the expressed comments, nor should a very precise appraisal be demanded. In spite of the obvious limitations of such comments we think that they are useful. During this session it is important to observe those who have little to say because the interpretation of silence is probably even more important than interpretation of expressed comments. Our training manager establishes contact with them and tries to probe their minds to find out what their silence meant.

A useful technique at relatively junior levels, which we have tried with supervisors but not yet with managers, is to have a follow-up conference. When a certain number of participants from a particular unit, say a factory or a department, have gone through residential courses, a one-day conference is organised for them in which not only the participants but their line seniors are present. In this conference they discuss two points (i) how much of what they had learned in their training course they have been able to put into practice and how, and (ii) how much of it they have not been able to put into practice and why. Although our experience of such follow-up conferences is so far limited, we feel that there is a future for this technique, the more so because it is held in the presence of line seniors.

Although it is desirable to try and assess the value of each course or programme organised by us, what really matters is the total effect in the organisation of its total developmental effort. This, we think, can be assessed, the most critical criterion being whether, when a senior vacancy arises, there is always somebody in the organisation ready to fill it. If we find that in spite of a co-ordinated developmental effort over a period of time, when senior vacancies arise people are not available within the organisation to fill them, then it is necessary to re-examine critically and revise our over-all developmental programme.

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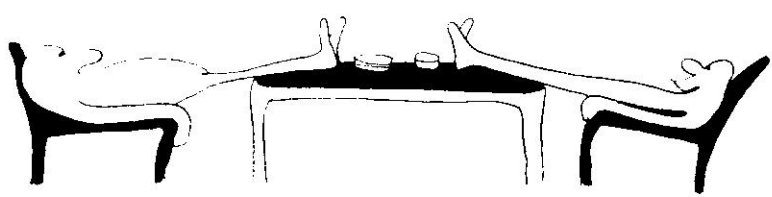
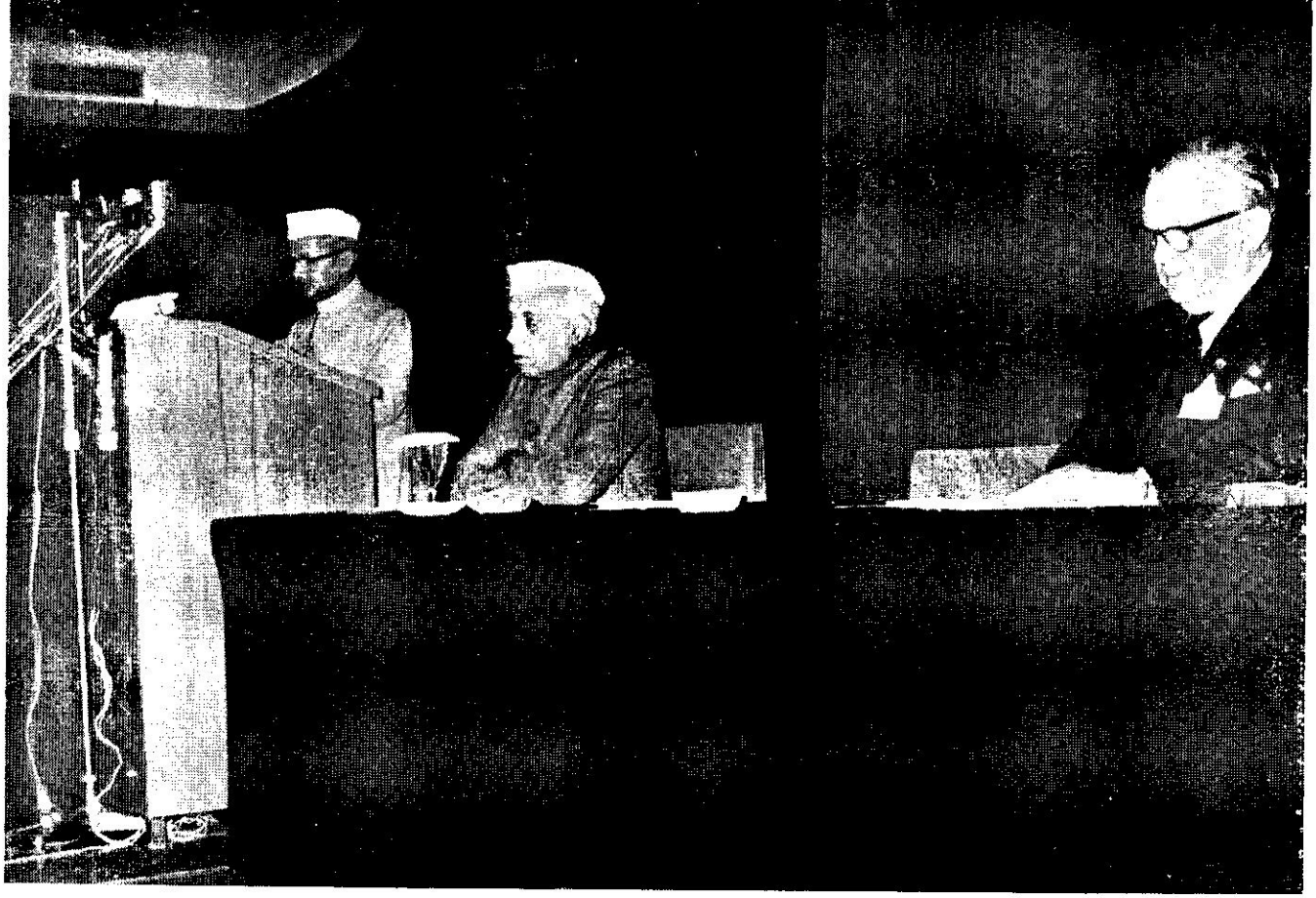


"Next week, we shall get organised."

NATIONAL PRODUCTIVITY COUNCIL

Prime Minister addressing the NPC Industrial Leaders' Conference, New Delhi, 16 December 1960



Sri Lal Bahadur Shastri, Union Minister of Commerce & Industry, addressing the N. C Industrial Leaders' Conference, New Delhi, 16 December 1960

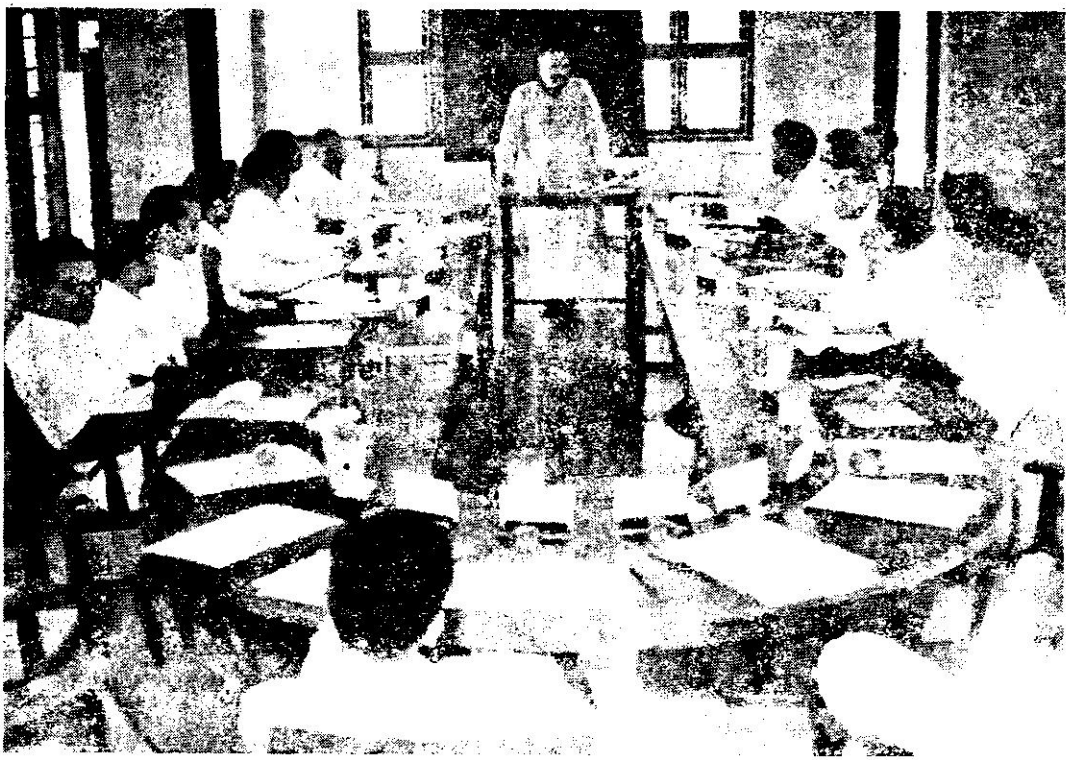
NPC

THE photographs, facing this page, as also those which appear in between and at the end of this article are illustrative. They show *npc* at various levels of the nation's life. Leaders of government, including our prime minister and his principal colleagues, top leaders of industry, are particularly now getting introduced in the productivity movement. *NPC* is also operating at the ground (plant) level and simultaneously conducting an extensive training programme. These have now become such regular features of the *npc* programme, both directly under its own auspices, as also through the agency of the Local Productivity Councils that it is very difficult to give here sufficient details of what the *npc* is doing concretely as its contribution to the achievement of a massive increase in industrial productivity.

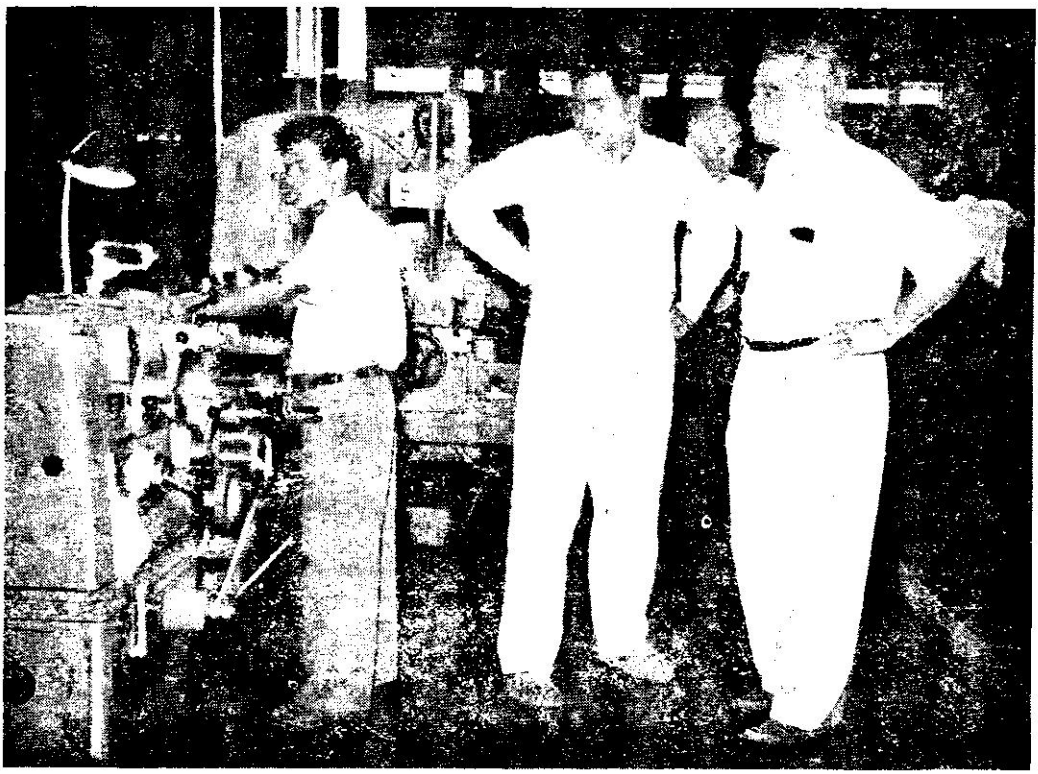
Apart from the training programmes which have become an important feature in the day to day functioning of Indian industry, *npc's* foreign training programmes, its extended library service, rotating through Local Productivity Councils, technical advisory service, a fairly large scale audio-visual programme, have continued to improve in volume and quality. It may also be added here that *npc* programmes have achieved their present magnitude because of the excellent cooperation received from all ranks in Indian industry.

This cooperation was particularly in evidence at the recent high level programmes, which have been widely featured in the press. The first phase of the programme began at Bangalore early in December 1960, comprising of a four-week advanced management programme for senior executives of private and public industrial undertakings. It was followed after a short interval by another high level programme concerned with management development in which the ILO collaborated with the National Productivity Council: this was the Conference of Indian industrial leaders, which concluded at New Delhi on December 18, 1960.

The very fact that the Prime Minister inaugurated this Conference with a thought-provoking speech (reproduced on page 219 of this Journal) is significant. Now that the Productivity Movement has directly received his blessings and guidance, it is likely that *npc* will bring into its programmes a regular stream of trainees to fill a large reservoir of skilled and trained personnel from which the industrial community and the Government's development programme could draw. This aspect of the Productivity Movement was particularly emphasized by the Prime Minister. The whole matter was put into the proper perspective by the Finance Minister's concluding talk on "The place of private enterprise in India's mixed economy". He said that the public and private sectors were just two organisational forms of the same entity that produced goods and services for the community. Envisaging ample opportunities for the growth of private enterprise, both In-



"Economic Development & Trade Unions", Madras Productivity Council



Mr. Omar L. Dewitt, NPC - TCM expert at Enfield, Madras

dian and foreign, in the coming years, he said that utilisation of these opportunities would depend ultimately upon the effectiveness of securing our overall objectives: social as well as economic.

The discussions of top industrial leaders and their exchange of notes showed intimate knowledge and consideration of the technical needs and demands not only of today but also of tomorrow. They were all unanimously of the opinion that the application of modern productivity techniques, such as work study, production planning, quality control, alongside technical and managerial training, would contribute massively to increase in productivity and the national income. They desired the intensification of *npc* activities along these lines.

In fact, the Management Development Programme has received a degree of appreciation, which compels repetition. During the current year *npc* proposes to organise four such programmes, each of a month's duration. The very first is scheduled to begin at Coonoor in South India on April 16, this year. It is proposed to hold the other three sessions at Nainital, Darjeeling and Poona. In all these programmes, the International Labour Organisation will collaborate with the *npc* and provide faculty members.

Currently, a series of top management seminars are being held one after another at a number of important industrial places. By the time this Journal is printed, this series of seminars will be nearly over, beginning from Kanpur (21 to 23 January), Bombay (28 to 30 January), followed by Madras, Cochin and Calcutta in the first fortnight of February, and ending at Delhi on 18 February, 1961. Four top level executives (executive vice-president, Bell and Howell Co, vice-president of Tool Steel, Gear and Pinnion Co, president of AC Nielson Co and president of AB Dick and Co) are conducting these seminars on management organisation and policy, production management, marketing and personnel management. These three-day seminars consist of six sessions: the first and last being plenary and the intermediate four sessions being devoted to group discussion.

These advanced programmes and seminars are over and above the normal training programme of *npc*. This normal programme consists of two parts: the long courses lasting from 6 to 12 weeks, covering work study, operations analysis, production engineering and tool design, production planning and control, marketing etc. The shorter programmes, lasting from 1 to 3 weeks, deal with some of the same subjects: a work study appreciation course for 10 days to 2 weeks and production planning and control for 2 weeks; in addition, these short programmes cover management development, work sampling, supervisory training, personnel management (each of 3 weeks' duration) and the TWI programmes for 1 week each. In all these programmes, US specialists, available through the courtesy of the Technical Cooperation Mission of the United States, help a great deal.

The programme in hand, beginning from January to the end of July 1961 is printed on the following page.

The foreign training programme is also gathering momentum. In 1958, only one team (consisting of 9 persons) went abroad (under US aid) for general study of industrial productivity. Since then, the progress has been as follows:

	No. of Teams	*Participants*
1958	1	9
1959	7	73
1960	12	123
1961 (Programme)	20	200 approx.

These statistics, however, do not tell the full tale. The first team that went in

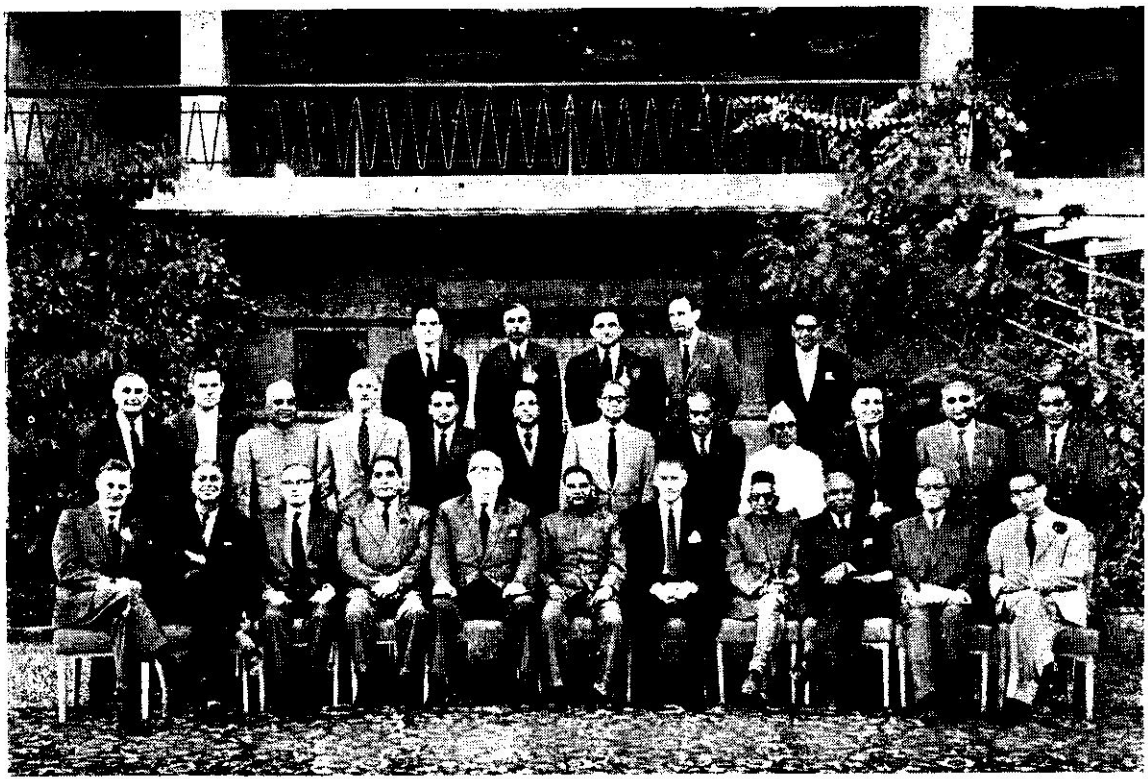
1	Marketing	January 23, 1961—Bombay
2	Management Development (3 weeks)	February 13, 1961—Visakapatnam
3	Production Planning and Control (2 weeks)	February 1961—Asansol
4	Work Study appreciation	February 1961—Nagpur
5	Personnel Management	February 6, 1961—Calcutta
6	Production Engineering and Tool Design (12 weeks)	March 6, 1961—Calcutta
7	Work Study for the Textile Industry (9 weeks)	March 1961—Kanpur
8	Management Development (3 weeks)	March 1961—Amritsar
9	Personnel Management	March 6, 1961—Kerala
10	Work Study (12 weeks)	April 17, 1961—Rajkot
11	Production Engineering and Tool Design (12 weeks)	April 17, 1961—Bombay
12	-do-	June 19, 1961—Coimbatore
13	Work Study (12 weeks)	July 24, 1961—Poona
14	Production Engineering and Tool Design (12 weeks)	July 31, 1961—Baroda.

1958 was a general study team. The seven teams sent out in 1959 covered plastics, cotton textiles, small scale industries, coal mining, management organisation, road transport and factory building layout. The teams sent under 1960 programme covered a still wider field: industrial safety, industrial maintenance, sugar industry, stores and inventory control, packaging, plant layout, cost accounting, supervisory personnel training, foundries, incentives, materials handling, marketing and distribution.

The 1961 programme is still more ambitious in a significant sense: 5 teams would be going to the Soviet Union (probably also to Czechoslovakia) and will study coal, oil, iron and steel, machine building and textiles. Besides these 5 teams, 15 teams will, under US aid, study paper, machine tools, quality control, automobile ancilliaries, welding, cement, light electricals, office management, fuel and power economy, printing, refractories, electroplating, personnel management and industrial relations.

Besides these short-term study teams, trainees are being sent out for longer periods, for study of important aspects of industrial productivity. In 1959, 37 trainees went out under US aid: 19 in industrial engineering, 12 in industrial management and 6 in industrial relations. All the 37 have returned. Under the same programme, 49 trainees were sent out in 1960, 10 of whom have come back. 19 trainees were sent for study of production management in France: all the 19 have returned. Two trainees have been sent under the Colombo Plan for

NPC—ILO CONFERENCE OF INDUSTRIAL LEADERS NEW DELHI
DECEMBER 1960



Dr PS Lokanathan, Chairman NPC, addressing the Industrial Leaders' Conference, New Delhi, 16 December 1960

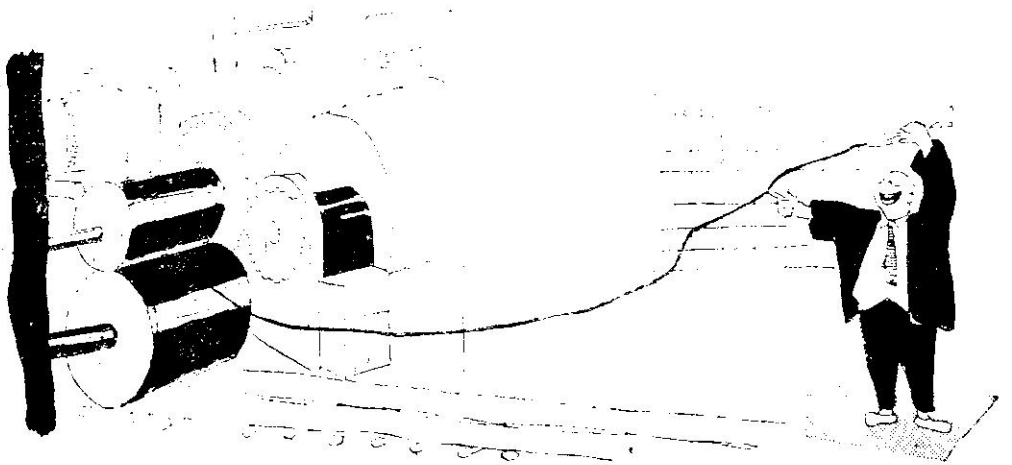
NPC—TCM experts at Enfields, Madras

work study in the United Kingdom in the ICI organisation. Two more such trainees have also gone under the 1961 programme. To France also, 15 additional trainees have gone for study of production management in January this year. 50 will soon go for study under US aid, in the subjects already mentioned. The Soviet Union has also agreed to train 25 Indians in production management for a period of six months commencing March-April 1961. Similar arrangements have been made with the Government of Czechoslovakia, which will take in 15 participants simultaneously.

NPC has formed a library consisting of over 300 films. Projecting and processing equipment has been obtained. A Productivity Exhibition showing photographs of industrial situation in India illustrating the application of productivity techniques, has been prepared. An Exhibition prepared from materials received from the International Cooperation Administration, United States, has been set up and shown in Delhi a number of times. The exhibits demonstrate certain improved productivity techniques, such as method study, work holding devices, plant layout, materials handling, plant maintenance and cost control.

The technical enquiry service of *npc* has begun to operate under hopeful circumstances. An advisory service is already in operation, *npc* specialists providing direct advisory service to Industry. During December 1960 for which detailed information is available, 17 visits were organised and services pertaining to methods improvement, quality control, production planning and supervisory training etc were provided. Mr J H Louwerse, ILO expert attached to *npc* has recently started productivity studies at Praga Tools Corporation, Hyderabad. Such studies were also undertaken by Mr Omar L Dewitt, TCM (USA) expert attched to *npc*, at the request of the Central Water and Power Commission at Nagarjunasagar and Sharavathi.

The activities, however, give only a general perspective of the vast field that is opening out for the productivity movement, in the expanding sphere of the *npc*. It is significant in this connection that the meeting of the National Productivity Council on 13 February 1961 would be attended by 21 representatives of the Local Productivity Councils, which have now acquired nearly a one-third representation on the *npc*.



The Changing Pattern of Management

R L Mitchell*

It is a matter of the highest public importance to determine, whether the managers of today will be adequate for the management of tomorrow's industry. And if we have any doubts on this score, we shall have to go on to determine what ought to be done now to encourage and train the men who will be needed tomorrow.

It may therefore be appropriate to think for a few moments about the changes which have already taken place in Indian management, and which are taking place now, to see whether we can discern any pattern in the change—whether there is any noticeable trend—which we can extrapolate to predict what the future needs will be. We shall have to gaze into a crystal ball, so to speak, to see what the future holds.

BEFORE we embark on this exercise, I would like to make one or two observations which have occurred to me. as an outsider I was brought up in another industriel climate, and I am therefore, psychologically disposed to compare what I see in India with what I was more familiar with elsewhere. But I have had the good fortune and the opportunity—and it is one which I value very much—of having been inside and closely looked round in more than 150 Indian industrial enterprises in the past few years.

The points which I would like to stress must necessarily be general, for there is not the space to go into the particular. My points must necessarily be random too for I have made no deep study of management in India nor have I the competence to do so. Above all they are subjective—the things which have struck me most forcibly—and therefore you have to make your own appraisal, how far my analysis is in the right direction.

First of all, it seems to me that we should be more concerned with the contemporary scene, rather than with academic delving into the history of the past, for industrial society in India is a young one, and one which is at the moment in a stage of rapid and surging growth, so that ancient history may have little to teach us. But in one particular I would like to look back a little—39 years to be exact—and that is in regard to management's attitude to labour.

Thirty nine years ago, in the celebrated dispute in the Ahmedabad textile industry in which Mahatma Gandhi played such a prominent part as an arbitrator—the dispute which set the tone for much

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of the negotiations and labour legislation which has followed since then—the employers' representative replied to certain proposals made by the workers' representative (Sri Shankerlal Banker) as follows:

"The points mentioned by Sri Banker are based on false assumptions. He assumes that mills are run out of love for humanity and as a matter of philanthropy, that their aim is to raise the conditions of the workers to the same level as that of the employers. We beg to say that his approach in this respect is wrong. In reality mills are privately owned, and are run with no other motive than to make profit. Workers are employed with this aim in view, and therefore employment is determined purely on the basis of supply and demand and from the point of view of efficiency. This is as it should be. Sri Banker's approach is impossible, unachievable, visionary and utopian. It is not practical for this world, for our country, or for this city."

These words, which were fairly representative of employers' opinions at that time, fall somewhat uneasily on the ears of today's managers, and this is indicative of the changed — and still changing — attitude of management towards labour.

Whether or not the extreme labour doctrine of co-partnership in industry will come to be adopted eventually; whether indeed the Gandhian thesis that the owners and the workers should regard themselves as co-trustees of industry, answerable to the community, will gain wider acceptance, nobody can say. But certainly there is nowadays among the greater part of the organised sector of industry an awareness on the part of management that the results which industry wants and which the country needs are only going to be achieved fully if the workers are so managed as to give them a sense of partnership or sense of belonging that will bring out their cooperation as members of a team.

In short the management attitude to labour has changed from regarding the workers merely as production resources, equivalent to machines, to the growing conviction that *Men Matter*: all the men in the business.

With this realisation comes a corollary: the effect which it has on the managers in the business. Some of the leading business houses have observed that when they introduced young graduates into their organisations right at the bottom of the managerial ladder, even at that bottom stage they spend rather more than half their time managing *people*, and rather less than half, managing *things* (things like bricks, steel, drawings machines, slide rules). And the higher up the managerial ladder which he climbs, the less and less time does the manager spend dealing with things, and more and more dealing with people. Thus some of the leading managers in the country, who are concerned with the problem of developing managerial skills for the needs of tomorrow, are beginning to question whether the academic and technical training which is being given to the young men—the particular discipline which they have to follow in the universities—to question whether the training is properly adapted for industry's managerial needs, and to ask whether the instruction should not include some basic training in the arts and skills of managing people, rather than purely technical matters.

Turning now to management structure itself, let us direct our attention first to the lowest level: the foreman or supervisory cadre, the men who stand closest to the workers themselves. Over the past ten years there has been quite

a change in the pattern of direct control of the operatives. The jobber—who did indeed exercise a truly managerial role, although he may not have been recognised as a formal part of the management structure—has largely, and rightly, disappeared. At any rate, there are many less jobbers than these were. The jobber is being thrown out, and with him unfortunately all too often supervision itself is being thrown out. It's a bit like throwing out the good with the bad: the baby with the bathwater.

Speaking generally, one of the most striking impressions which the observer from the older industrial countries gets of Indian industry is of the relative weakness—almost the relative absence—of the foreman cadre as it is known in the west. This I believe to be one of the major reasons for the lower production performances of some of the factories in the manufacturing sector. All too often there are supervisors who have been recruited from the ranks of technical graduates, and who understand perhaps too well the technicalities of their positions, but who exhibit little skill in handling their workers, servicing their machines, or controlling production. Where there are supervisors drawn from the ranks of workers, there is often doubt whether they should truly be classed as members of management.

Thus the pattern of management in India today often includes a gap where there ought to be a foreman—or something like a foreman. It may well be that the pattern of foremanship which is familiar in the countries of Europe and America will not fit well in the Indian scene, so that some fresh way of discharging this managerial function will have to be found. That this can be done has been demonstrated in a few factories, even in India, where special measures have been taken over a number of years to help foremen recruited from the shop floor to overcome not only their industrial difficulties, but also the social problems which have been created by their promotion.

Of all the influences for change at work on the management pattern in India perhaps none has greater potential than the emergence and growth of the public sector, which now represents a sizeable portion of the total industry, and of course is increasing yearly. Here the observer senses that a good deal of rethinking on management is currently going on.

If this is so, a significant contribution which the public sector will make to the management pattern will be a large and growing demand for wholly professional managers—men for whom management is a skill, a profession: something quite separate from ownership.

When a new public enterprise is set up—particularly a manufacturing enterprise, the government and the community are both prepared for a period in the early stages for the enterprise not to be really competitive especially where the products are new and the processes complex. A good deal of rope is allowed to the new undertaking. But it is the general impression that the rope is nowadays getting shorter. As experience of management grows, and with the example of several public enterprises which have become commercially successful, the period of grace which new enterprises are allowed is getting shorter, and there is less willingness to tolerate unskilled management.

It seems to be increasingly recognised that the particular abilities, talents, strengths required of the successful manager of a public enterprise may not be the same as those of a successful civil servant or public administrator. It is also being increasingly recognised that the managerial skills required for success in the public sector are almost precisely those needed for success in the

management of private companies, so that the myth that different types of managers are needed is dying.

In the private sector too, there are forces at work which will accelerate the move towards professional management. The changes in company law, the modifications being wrought in the managing agency system, the tax laws, and above all the increasing complexity of industry in an increasingly competitive world, are all giving rise to more autonomous units and to many truly managerial positions both in the control of subsidiary companies and the control of groups of companies, which will have to be filled by men who are not primarily owners of the business, but for whom management is a salaried job.

As the industrialisation of the country gathers momentum, as outside competition increases, it will be found that the managers in India are pretty thin on the ground. Where direct comparisons can be made between industries which function similarly in India and in the western countries, it will often be found that the density of managers in the Indian industry is only about one-third of that in the west. India will have to close this gap rather more, before her industries can compete on equal terms with the rest of the world, with equal or better quality of goods, at equal or lower prices.

This growing recognition of management as distinct skill of its own, and moreover as a profession in which a good deal can be taught; in which the skills are transferable; in which there is much to learn besides the lessons of experience, is getting a fillip from the growing number of examples in the country of what can be achieved by good management. There are now several concerns which can point to successful programmes of cost reduction; to marked increases in productivity; to steadily increasing efficiency; all of which have been achieved by sound have managerial action.

That many management skills can be taught and learnt is also being realised in many of the very small units. Both as a deliberate act of policy and also as a product of the trading conditions in the country small-scale factories are springing up all over the country, though perhaps not yet at the rate which the sound growth of industry really needs. Some of these which have been established for some years now and have expanded rapidly have followed the standard pattern: first, control of all activities by the sole owner; then control by the owner but delegation of some managerial activities to other members of his family; last, the introduction of salaried outsiders into the management. Even these small factory owners are finding that entrepreneurial ability alone is not enough once a certain stage of expansion has been reached. Of course, there have always been some entrepreneurs whose skills have been such that they could successfully handle their enterprises through all the stages of growth up to quite large concerns—these perhaps were the intuitive managers—but more and more the small men are finding from their own operating experience a need to supplement their trading abilities with other skills.

These perhaps are some of the reasons why much more interest is being shown now in management training by industrialists both big and small. This, I think, is certainly one of the elements in the changing pattern of management: the recognition of the value of management training, and the increasing desire for it in the country.

Men who would have formerly educated their sons to be doctors, lawyers, engineers, and often sent them abroad

to study these professions, now include in the list of acceptable subjects for study that of management itself. Many young men are being sent abroad now purely for management education, and many more are seeking training in this country itself.

Quite apart from their sons, leading industrialists are increasingly giving attention to the training of their subordinates and executives, both in company programmes, and by sending them to courses run by outside bodies. That this training has now become quite an accepted part of the pattern was amply demonstrated by the participants in the recent Advanced Management Programme in Bangalore. There, not one of them—and they were all senior men, many of them with long experience—thought it at all odd that he should go in for a course of training in management. This would not have been the case ten or fifteen years ago.

There is one aspect of management in which progress is still very slow: and that is in the matter of delegation. In contrast with other industrial countries, there seems to me to be comparatively little delegation practised in India. Often, too, there seems to be an unwillingness on the part of subordinate managers to accept the delegation of authority when it is made: there seems to be a too frequent sheltering under the umbrella of higher authority. This is perhaps equally true in both the private and the public sectors. If the diagnosis that industry is going to have to rely in future more and more on junior or middle management is sound, then this problem of finding a mode of delegation which really works in Indian conditions is one which will soon have to engage the attention of the men at the heads of enterprises in the both sectors.

From all these random observations—these snapshots as it were of parts of the kaleidoscopic pattern of management—does any trend emerge? We may sum up the pattern of change in two main points: First, there is indeed a strong trend towards professional management, as distinct from and additional to entrepreneurship. Secondly, India is going to need many, many more managers than she has today: many more skilful managers.

If a bowler had to set up his own pins after each frame, his game would soon suffer, owing to lack of attention and interest. This responsibility is "delegated" so that he can enjoy and concentrate on the major part of the project, the bowling itself.....Use this same thinking in your work. Evaluate everything that must be done to determine whether you should do it or whether it should be delegated. Is it "bowling" or "pin setting" ?.....The attitude that "the only way I can get anything done is to do it myself" is a dangerous one if the tasks referred to can and should be accomplished by a subordinate. Being busy is no virtue in itself not if you are doing other people's work.

Business, Productivity and Social Change

K SWARUP*

Productivity is essentially a business proposition. Business, however, does not operate in a vacuum. It lives and functions within a given social environment which conditions it. Further it is wrong to believe that a productive business has no philosophy or no moral code. In fact, no business can be really productive even in the sense of increasing profits over a long period of time, if it has no operative moral code. In terms of economic purity, American business probably has the best reputation; and Henry Ford has been rightly regarded as the most successful businessman in the modern history of the United States. The following dialogue reproduced from his record has almost a Socratic significance in modern economics. It is not reproduced from a university seminar but from the proceedings of a court of law.

STEVENSON : "How, I will ask you again, do you still think that those profits were awful profits ?"

FORD : "Well, I guess, I do, yes."

STEVENSON : "And for that reason you were not satisfied to continue making such awful profits ?"

FORD : "We don't seem to be able to keep the profits down."

STEVENSON : "Are you trying to keep them down ? What is the Ford Motor Company organised for except profits, will you tell me, Mr Ford ?"

FORD : "Organised to do as much good as we can, everywhere, for everybody concerned. To do as much as possible for everybody concerned. To make money and use it, give employment and send out the car where people can use it. And *incidentally to make money*".

STEVENSON : "Incidentally make money ?"

FORD : "Yes, sir."

STEVENSON : "But your controlling feature is to employ a great army of men at high wages, to reduce the selling price of your car, so that a lot of people can buy it at a cheap price and give everybody a car that wants one."

FORD : "If you give all that, the money will fall into your hands. You can't get out of it."

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* Chief Administrative Officer, Indian Railways, Integral Coach Factory, Perambur.

APART from a few isolated business concerns, the general run of Indian business cannot be regarded as productive; and it is so because of its economic philosophy. We do not appear to have sufficiently realised that high profits, high wages, high rates of taxation, high productivity all go together. If the mass of the people get low wages, there will be little demand for the products of mechanised industry; and highly productive business just cannot come into being. Henry Ford made enormous profits through charging low prices and paying high wages. Low prices resulted into an enormous and increasing turnover. The resources of the Ford business were fully utilised (that is the meaning of productivity). Every man in the Ford organisation worked to the limit of his capacity because each one knew himself to the best beneficiary of the Ford business. Because of the very large turnover, the smallest margin of profits on a car turned out to be millions of dollars; and this process became cumulative.

If Indian business has to become productive—as it must be in the national interest—it has to absorb at least a part of this Ford philosophy.

Traditional capitalists claim that business is essentially and principally aimed at profit and therefore higher and higher dividends, but Henry Ford took an entirely different view of industry as a business. He thought of business and industry, first and foremost, as a public service. For him, profits were merely what enabled him to keep the factories going, to carry out his plans of expansion and to maintain his company's independence. Profits were also the proof of success, the proof that he was right and that his methods sound. To quote his record again: "...a reasonable profit is right but not too much. So it has been my policy to force the price of the car down as fast as production would permit and give the benefits to users and labourers with resulting, surprisingly, enormous benefits to ourselves."

Management of Indian business must undergo a real reorientation along lines indicated in the preceding paragraph. The popular generalisation 'A manager does his work by getting other people to do theirs' tells only part of the story. Leadership is an essential part of management and finding leaders is a problem that grows more difficult as industry expands and becomes more complicated. In the newer industries of developing countries like ours, the demand for leadership cannot be fully met from traditional sources.

We are now relying less and less on foreign management. We have therefore necessarily to choose and train an increasing number of managers from a wider section of the community. If management were an exact science this could be a comparatively simple matter but management is not learnt by reading books or even by participating in set courses of study. We should, therefore, not confine ourselves to higher management by administrative officers only, but encourage scientists, technicians, labour leaders, professors, lawyers and politicians to come forward to join the higher management.

This new management must not only have a new technology but also a new vision as to the ultimate aims of the social economy. To quote from the Duke of Edinburgh's study conference on human problems of industrial communities:" ... 'We have as a target the doubling of the standard of living, which can be brought about only as a result of reducing production costs by economising product designs and developing advanced manufacturing processes and facilities....."

This rate of change will mean a radical alteration in the whole pattern of employment. There will be a large number of people employed in technical, administrative and other capacities many of whom will be diverted from the ranks of those manually employed and if account is also taken of shorter working hours it can be assumed that the output of a smaller force of manual workers will have to be increased three or four times to achieve the aim of doubling the standards of living for all!

This really means two things: that small groups of manual workers, who will be called upon to make massive increases in their productivity, must be adequately motivated under a leadership, which enjoys their confidence, which knows their difficulties and continually moves to solve them without being asked to do so. Secondly, the new technology of management demands that the least productive worker be capable of a good deal of planning. The more planning he can do, the more responsibility he can take for what he does and the more productive a worker he will be. Our problem will be that many workers of tomorrow may have to be able to do more planning than a good many people, who call themselves managers, are capable of.

To sum up, good management should be capable of a good deal of planning to get the best out of machinery and men at their disposal. This is very important: as Hawthorne experiments thirty-five years ago showed, that no matter how highly developed the technique of production, how excellent the physical working conditions, or how high the amount of pay received, more important factors were, whether or not the worker liked or trusted his supervisor; whether he found a source of pride and satisfaction in his job or whether he found his contacts with his co-workers pleasant. All these had a much greater effect upon his output even in a routine assembly job.

It must be remembered that the labour of human beings is no longer a commodity, and the worker no longer sells his labour but enters into an association with management in order that what they produce together will provide a livelihood for both and at the same time better service for the customers.

Taking these experiments and experiences into consideration, the most important thing for any progressive management would be to develop good human relationship between management and workers. Once this is achieved, the technical departments can play their role successfully by organising the efforts of workers to higher productivity.

In this connection we may devote some time to standardization, which plays a crucial part in large scale economic development. Standardization has been historically an important factor in the ascendency of the factory system of mechanical production and later in the development of mass production techniques and automation.

Standardization also leads to simplification in industry. The advantages of standardization can be summarised as follows:

To the producer:

1. Longer runs with fewer changes on the production line
2. Reduced tooling and set up time
3. Possibilities of increased mechanisation and special purpose plant
4. Easier training of operatives
5. Simpler and cheaper inspection
6. Less capital invested in idle plant, tools and space
7. Reduction of stocks of materials, components and end-products
8. Reduced call on drawing office and design office staff for special orders,

leaving them free for work on new designs or improvements

9 Simpler clerical and administrative work

10 Easier service and maintenance

11 Concentration of sales and advertising effort on a narrower range

12 And hence, increased productivity, leading to reduction in costs and prices and to increased sales.

To the user:

1 Lower price for a given quality or performance

2 Reduced variety and level of stocks at all distribution points

3 Readier availability

4 Improved service and maintenance facilities.

The present position in the markets of under-developed countries is that a few persons enjoy a variety of products, imported and domestic, while the mass of people go without the bare essentials of a modern life. Standardization will correct this highly anomalous and unproductive state of affairs. If a high standard of living has to be provided for the large mass of people, specially in heavily populated countries, it can only be on the basis of standardization.

This brings me to another important phase in the development of our industries in India. We are entering into technical collaboration with different countries and different firms which are used to different standard specifications and possibly have more highly developed machinery and plant at their command. To get the highest productivity it is necessary that the various collaborators be asked to adhere to the Indian Standard Specifications and design products which would be more suited under our climatic conditions. To sum up, elimination of diversified products and adopting standardization as far as possible and using raw materials to ISI or other Indian Standard specifications would lead to better productivity and reduction in production costs.

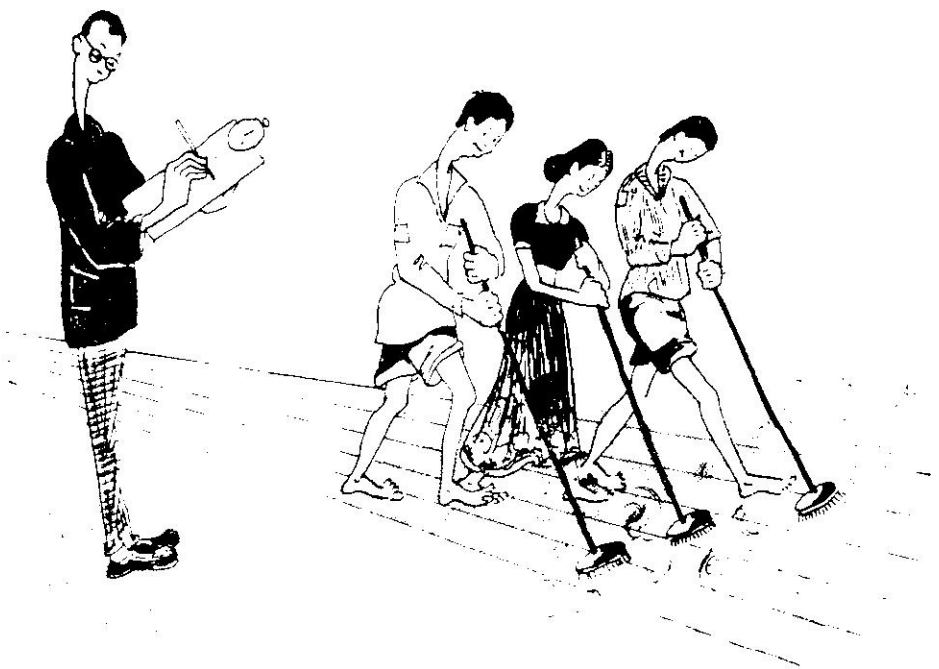
After a decision has been taken on the products to be manufactured, it is very necessary to make detailed studies of how to produce those articles in the most efficient manner eliminating waste wherever possible. This could be achieved by technicians well trained in planning, work study, motion study, time study etc. So far we have banked on cheap labour. This must change now. The important thing now is to produce consumer goods at comparatively cheaper prices within the reach of the common man. It, therefore, means that planning (work studies, method studies, time studies) needs careful attention. There is, however, one thing to be remembered in this connection. Automation is now being adopted in the western countries but we in India have to be careful in this regard, because single-purpose machines suitable for automation are more complicated and are not yet being manufactured in India. They have, therefore, to be obtained from abroad at a much higher price and their maintenance is also a problem. Manpower in the western countries is a problem and therefore automation for them is a necessity. In our country, there is plenty of unemployment and manpower is available at command. We have, therefore, to provide more employment to wipe off the large unemployment existing in our country. To the technicians, therefore, I have to advise that these different circumstances should be given due weight before coming to decisions in their anxiety to increase productivity.

This does not mean that we should not resort to mass production methods. There is no other way of increasing pro-

ductivity. But we must clearly understand what it means.

The ordinary citizen would define mass production as large scale production by the use of interchangeable parts, but as Henry Ford himself showed, mass production is the focussing upon a manufacturing operation of seven different principles viz. power, accuracy, economy, continuity, system, speed and repetition. When all the seven are used to make a car, tractor, refrigerator, airplane or other complicated commodity, then mass production throws open the door to plenty, low prices and an improved standard of living. Arming a people, in peace against want, in war against enemies, it becomes an instrument to alter the shape of civilization.

TIME & MOTION STUDY



"Always keep in mind that you can't make money If you run the job the way it is timed .."

An Experiment in Productivity*

25 years ago, in a small garage, a pioneer manufactured a sewing machine. It developed into a small factory situated in a house, and it made a few machines every month. A few financiers joined hands but in the face of foreign competition and the poor quality of production, they found it difficult to continue. An important industrialist was approached to take over the factory; and he did. A statistical table printed in the text of the article shows the results: a decrease in the number of manhours spent on producing a sewing machine from 134 in 1946 to less than 10 in 1960, a four-time increase in employment in the same period, and so on.

SEWING Machine manufacture has during the last 100 years developed into a fine art and represents a considerable achievement even in the industrially advanced countries, but in India, with little background of Production Engineering, the task has been immeasurably difficult. It is an intricate and precision Industry which involves the manufacture of about 400 components and nearly 4,000 operations.

Want of technical skill and background of production engineering have been obstacles but a much bigger difficulty was caused by a wrong start. There did not exist a single drawing and whenever there was any difficulty reference was made to the Pfaff Sewing Machine components, of which this sewing machine was more or less a copy. Machine tools or jigs or fixtures were all of antiquate design and were of poor construction. Gauges were almost non-existent. Components were produced as per samples without much accuracy. Considerable difficulty was felt by the assemblers in fitting the components by filing and hammering. The final finish and good working of an assembled machine entirely depended upon the skill of the individual worker. Some machines were really good in use while others constantly gave trouble to customers who abandoned them in disappointment, consequently resulting in creating a great prejudice against our sewing machine. As a matter of fact, every machine sold needed a mechanic with it.

The small factory was shifted to new premises in 1938. By 1940 we were manufacturing a few hundred machines per month. We had several other items, such as water meters, railway signalling apparatus, typewriters, electrical measuring instruments, cooking ranges etc. We had to postpone our plans for proper organization and expansion, as the works were requisitioned by Government for war work.

In 1944, Management was able to place orders from UK and USA for some of the general purposes machine tools and equipment and completed all the component drawings, including assembly drawings, to determine if there would be any obstruction due to mistake on any individual component when

* Published by the courtesy of Sri T R Gupta

the machine was running. Process sheets were laid out giving the sequence of operations, indicating the type of machine required, jigs, fixtures, tools and gauges needed in different stages of production. In many intances components were so small and so intricate that each component needed some 60 operations to complete, and had to be produced in very close tolerances.

The major difficulty in accomplishing the work was want of trained personnel for designing tools and machines, developing new methods, determining suitability of raw materials, production of tools, establishment of production methods and quality control. Besides all these, we had a past legacy due to improper training of workers. Production was carried on in the past through contractors who were skilled mechanics or machinists. Each one of them had a batch of 8/10 workers, who were very poorly paid by him, the major share being pocketed by the contractor. There was no arrangement for work measurement and the rates were fixed arbitrarily. As the operators did not get sufficient wages, they would often leave the work. Due to lack of training, materials were wasted and tools; machine utilisation was very poor. Workers were also misled to believe that the purchase of new machinery and establishment of new methods will lead to retrenchment of workers.

This was the most critical stage in the history of the Works. War was coming to a close the decisions had to be made as to which other lines of production had to be dropped, excepting sewing machines. Management decided to gradually reduce our lines of production and stick only to sewing machines, electric fans and hurricane lamps. The last two items came into production on account of war requirements. Later on, the production of hurricane lamps was stopped and only sewing machines and electric fans were produced. Even these two lines were separated into two units, about five years back.

Management experienced manifold difficulties in peace-time reconstruction. Technicians had to be trained, quality articles had to be produced and sold at a price the customers would pay. On the other hand, a trained and satisfied labour force had to be developed. To achieve all these objectives, considerable expenses were incurred in getting foreign technicians to train the personnel in the shops, offices, and in sending Indian technicians abroad for specialised training.

Besides importing modern plant and machinery, fresh layouts were prepared, operations divided and sub-divided, necessary tools and equipment produced, operators trained in necessary skills, time and motion studies conducted and incentives fixed. Raw materials were standardised and close control was introduced on incoming and in process materials. Performance standards of finished products were brought in line with that of the best foreign makes, line production methods were introduced; general purpose machines were substituted by special purpose machines to ensure interchangeability. Long runs were introduced with fewer change-overs. Proper materials, handling methods were introduced to ensure constant flow of materials in the operations, to save manual labour and prevent damage to materials.

No doubt, this was a gradual change. Layout of the shop and methods of production had to be modified twice or thrice to suit our requirements. To improve working conditions, most of the buildings had to be demolished and new ones built with better light and ventilation. Extensive studies were conducted to get the best out of the existing plant

to yield the maximum the equipment was capable of without straining the workers.

But the most important factor that the management took into consideration was the "man", through whose whole-hearted cooperation and participation, a miracle in production was brought about. How this feeling of participation was made possible has been described later.

Some comparisons of the working of the Concern may now be given. Taking 1946 as the base year, the table printed below shows how productivity has gone

machines whereas consumption of electric energy has increased 5 times, investment on plant 13 times, covered space 11 times and total investment 15 times. The increased expenditure on indirect services and better utilisation of equipment has helped increase in the productivity.

A brief mention has been made of the importance of the worker. The first step for us was to disband all the contractors, fix norms of production and to introduce an incentive scheme as far as possible on individual basis, but otherwise on group basis. Arrangements were made for training the workers for different

	1946	1960
1 Number of Employees	1362	5029
2 Investment in rupees per employee on plant and building	1891	6447
3 Horse power installed per employee	0.22	0.97
4 Kilowatt hours used per production employee per hour	0.32	1.61
5 Man-hours per Sewing Machine	134	9.80
6 SERVICE DEPARTMENTS (tool room, maintenance, inspection, design office, development & Research).		
(a) Investment in rupees on plant & building	1,55,000	3,047,000
(b) Number of people working	129	885
(c) Investment in rupees in materials handling	nil	627,000
(d) Investment in training facilities	nil	4,50,000
(e) Recurring expenses on training (including stipends and materials)	nil	400,000
7 Total investment	5,000,000	76,422,000
8 Investment on plant	1,647,000	22,417,000
9 Investment on buildings	542,000	9,752,000
10 Plant & Machinery utilisation] (percentage)	28	79

up during the last 14 years and how it is influenced by other factors like investment per employee on plant and building, horse power installed, kilowatt hours used; and how intensively machinery and men have been utilised. It also gives an idea of the expenses incurred on providing better services in term of designing, development, technological research, tool room, maintenance, inspection, quality control, industrial engineering and training centre.

These figures show that productivity has increased 14 times in sewing

jobs. After acquiring the necessary skill and practice, their earnings increased. We had all the support from the workers. We made the contractors *mistries* (junior supervisors or tool setters), and fixed reasonable remuneration for them. It was not an easy job to persuade the workers to agree to the incentive scheme. They had many misgivings in their mind. But the management gave a written assurance not to change incentive rates without effecting change in production methods and to maintain the past average yearly earnings. This acted as a big spur for

increased earnings and also helped the management in the better utilisation of its plant and machinery. Average production (bonus) earnings per man per month are given below.

	Rs
1946	nil
1950	20 -
1954	48 -
1956	69/-
1958	108 -
1960	160/-

Contrary to the practice of chasing the workers for higher production, this scheme called upon the management to provide uninterrupted flow of process materials, tools and maintaining machines in good order. So it was a question for the management to plan the work before-hand in detail for securing the maximum possible degree of team work for greater efficiency. To get fuller cooperation of the indirect employees or of the staff members or of the supervisory staff, payment of average production bonus, varying from 100 to 60%, depending upon the extent of effort, was introduced.

In 1950, we also introduced a profit sharing scheme. The employees are being paid 1/3rd of the Company's net profits (before deducting taxes). The figures given below in Table (a) indicate the benefits the employees derive due to this Schme.

To draw from the fund of experience of individual employees, we started a Suggestion Scheme. We have in the past got some very intelligent suggestions which have proved beyond doubt that "Brain is not the monopoly of a few". This has given confidence to our employees and a feeling of participation. We are giving below in Table (b) the number of suggestions received and the percentage of suggestions rewarded.

In the past 7 years, for most of the jobs, minimum standard of education for the new recruitment has been matriculation. For skilled jobs, recruits are trained to improve their skills according to exact job requirements. Out of 5,000 employees, we have over 2,500 matriculates. Age limit is kept between 18 to 20 years at the time of recruitment. The number of employees trained and promoted due to the opportunities offered to them is as follows.

Tool Setters	23
Junior Supervisors	95
Chargehands	19
Assistant foremen	8
Foremen	5

Table (A)

	1946	1950	1954	1958	1960
			Rs.		
Profit Share Paid Rs	Nil	271000	827442	1,986661	2,552305
Bonus in terms of basic wages	Nil	2 months	4 months 9 days	6 months 12 days	6 months.

Table (B)

	years			
	1954	1956	1958	1960
No. of suggestions received	373	158	251	292
Percentage of suggestions rewarded	24.1	60.1	31.4	56.9
Cash Reward paid in Rs	4750	6127	7140	11590

This has created a feeling amongst the employees that they have chance for promotion and for improving their earnings and getting a better status in life by hard work and intelligent application.

We have a continuous arrangement for selection from amongst the employees, trainees for giving part time courses at the level of Higher National Certificate. For higher executives, all available facilities for training in the country and abroad are availed. Through job rotation and giving responsibility of a complete section as a manager, chances are given for continuous development of managerial skills.

The management gave a written assurance to the employees that no one would be retrenched on account of modernisation or rationalisation. The management also further assured them that the past years' average earnings, in case a worker is shifted to a new job, will be maintained. The following figures reflect job security and satisfaction of the employees.

the workers themselves manage the same. Living quarters have been built for about 20% of the employees. A cooperative credit society has been started for advancing loans. Employees are encouraged to purchase lands and build their houses and as a result nearly 2000 of our employees have been able to build their own houses under the Scheme.

We have a recognised Union and have an agreement, which duly takes care of the interests of both sides. A grievance procedure has been laid down and is being followed. Rules and regulations have been framed for modernization and improvement of methods. On the whole we have found the Union quite cooperative and day-by-day better understanding is developing. As a result there is not much resistance in introducing new changes in the methods, substituting old machines by new and more modern machines, general purpose machines by special purpose machines; creating line production and shifting and retraining of employees from one job to another. Whenever there is a

	1946	1950	1954	1958	1960
Labour Turnover %	12.2	8.09	4.09	0.5	0.2
Average hourly earnings per head in rupees	0.34	0.56	0.87	1.21	1.61

A magazine *Works Samachar* is being published to serve as a medium of education, communication and eradication of social evils existing in the community. An Annual Fare has become a very important event of the year when all members of the employees' families visit the factory and have fun. We have a subsidised canteen, where a wholesome meal is provided at 1/3rd of the cost. Tea is provided at 2 nP per cup. We have also organised dramatic and gymnastic clubs, sports, library etc. and need we always sit down across a table and discuss our problems. There has been hardly any occasion to refer any dispute for reconciliation or arbitration. Our experience is that the management's lot of pinpricks and unnecessary worries are considerably reduced by recognizing the Union. It creates a better work atmosphere and better understanding between the management and the employees.

It may be added here that special productivity techniques such as standar-

disation, specialisation and works simplification have proved very useful handy tools for the management. Variety in manufacture of components has been reduced. Specialised training to different categories of employees has reduced training time and imparted better skills. In work simplification, industrial engineers looked to dividing and sub-dividing operations and developing skills of the people to make it easy in operation and less expensive in cost on account of dispensing with skills.

There is another very important method in reducing re-work: improving the level of quality by control of processes. Our rejections used to be at a level of about 7% before we introduced Quality Control. It has come down to less than 3%. Instead of doing *post-mortem*, that is, selecting bad parts out of good parts or vice versa, the quality is automatically maintained at the desired level through the control of processes. This was very necessary, as initially we suffered a good deal due to past prejudices. Now, not only in the country, but even in the most highly industrialised countries, the standard of our quality is accepted and we are able to export our goods in ever-increasing volume. We feel that quality and quantity go hand-in-hand, and we have achieved both.

Even a good product fails to find market if it is not backed by proper sales and service organization. It is here our management achieved a unique distinction by organizing a very wide network of over 2000 selling points and 1500 service centres throughout the length and breadth of the country. We have over 800 tailoring and embrodiery schools running in the country and abroad, where over 50,000 students receive instructions in tailoring, cutting and embrodiery, under the supervision of highly trained teachers. We maintain trained mechanics at every selling centre for rendering quick service to our customers, and even in the remote villages we have provided mobile vans for giving free service on the spot.

We started exporting Sewing machines and electric fans in 1948/49. We are exporting to about 40 countries all over the world. Exports during 1959 were over Rs. 8.2 million and we expect that our export figure will be at a level of Rs. 12.5 million during 1960. The competition in the export market has been very severe. It has particularly called for a lot of courage to establish export of sewing machines to highly industrialised countries like the USA, Canada and the UK, and other European countries, and we are happy to say that they are now our regular customers.

Apart from various factors discussed above, another most important factor stands out clear and that is scientific management. There is no substitute for it. In the absence of this, every effort fails. It is the responsibility of the management to clearly define their objectives and goals, to build a sound organization with a good team spirit, well-knit, and with proper training at all levels. The effectiveness of the team or the individuals will depend on clearly defining the functions, duties, individuals will depend on clearly defining the functions, duties, responsibilities of each individual and delegating the necessary authority. It is also necessary to keep the organization above the individuals, select, train and promote the proper people for the proper jobs. The management should be by competence of the persons and not by inheritance.

As a result of the progressive policies followed by our Management, we have made a remarkable progress, which is clearly reflected from the figures given in the Table on next page.

	1946	1950	1954	1958	1960
Total Employment in					
Sewing M/c./Fan Nos.	1961	2638	5669	10208	15208
Direct in the Works	1362	1788	2619	3808	5,029
Feeder Industries	—	- -	950	2200	4,679
Sales & Service	600	850	2400	4200	5,300
Total Out-put (in hundred thousand Rs)	35.98	70.40	187.37	537.00	720.63
Cost of Hand Sewing M/c	100	93.28	90.75	85.59	80.31
Raw Material Cost Units	100	123.00	141.00	171.80	171.52
Labour Wages Units	100	164.00	254.00	354.00	336.02
Sale Price of hand Sewing Machine Rs	220/-				Rs 160/-
Profits (in hundred thousand of Rs)	Loss	8.18	16.31	38.52	51.94
Taxes paid (—do—)	Nil	0.47	5.22	14.45	19.50
Dividents paid to Share Holders %	Nil	6.00	6.00	12.00	17.15
Exports value for the year	1956/57 Rs. 13.96 (in hundred thousand)				
	1957/58 Rs. 24.96		—do—		
	1958/59 Rs. 45.11		—do—		
	1959/60 Rs. 82.52		—do—		

The figures clearly illustrate as to how a well-managed Industry benefits each and all. It provides more jobs, increases material wealth of the country, reduces cost of production, provides better standard of living of those directly concerned, and enables to improve quality, along with other various advantages. In addition to the various benefits that accrue from a well-managed industry, it is a very good example as to how it could contribute to the well-being of the country.

We have had, however, our share of difficulties: many many difficulties in implementing various new schemes. We have made mistakes by not employing early enough proper selection and training of employees and proper work measuring methods. Partly our mistakes were due to circumstances and partly due to our ignorance. In the new units, which we have planned to set up, our past experience will guide us.

This has been a great social experiment so to say. Mistakes, no doubt, we made, but we have learnt a good deal, and have acquired a big pool of experience, and have trained hundreds of young executives who have confidence and faith in themselves to face the new challange. We have found from our experience that the educated middle class boys, when properly trained, are really good assets of the Organization. The achievements that our industry made in the field of new technology, research and development, is benefitting the country as a whole. Many new ideas can be seen in operation by the industrialists and young men of the country. They can avoid many pitfalls which we had to face.

In fact, the considerable experience in the mass manufacturing methods which we have acquired and the goodwill of our people we have gained, have further emboldened us to set up several new other units to produce precision items like ball bearings, Sealed units for Refrigerators and Air Conditioners, the Zig-Zag Sewing Machines, Tungsten Carbide products and Special Purpose Machine Tools. Does it not clearly prove the positively promotional role of our industry, creating new opportunity for the young men of our country, and reducing the dependance of the country on foreign exchange by exporting the products? Does it not prove as to what has been accomplished by one industrial unit can be achieved by other industries?

NPC Technical Enquiry Service

NPC has secured Technical Reports prepared by the ICA (International Cooperation Mission of the USA) and EPA (European Productivity Agency) in response to Technical Enquiries, received by these organisations from various countries. About 8,000 such Reports are available and they cover, as the list printed below shows, a very wide range of manufacturing processes. NPC would like to share this material with Indian manufacturers in the confidence that it would be useful to them in the solution of the many technical problems that confront them from time to time. Specimens of types of Technical Enquiries are given on the following pages and are worth perusal. It is obvious that many Indian manufacturers would identify them as their own problems.

2. More Reports on Technical Enquiries from the ICA and the EPA are being recieved and will be announced in this Journal and otherwise.

3. Manufacturers are invited to send any specific technical enquiry to NPC. If the requirement can be met from the available technical enquiry reports, copy of the relevant document will be reproduced and sent. Alternatively, selected enquiries will be processed to industry and trade associations, industrial and research institutions, universities, manufacturing firms and other foreign organisations, in a position to answer the technical enquiries addressed to NPC. It may be mentioned here that the ICA has offered to render help to NPC in this connection.

4. Enquiries may kindly be addressed to the Technical Enquiry Service, National Productivity Council, 38 Golf Links, New Delhi, in the form appearing on page 287 but this is not a rigid specification. All that is requested is complete and comprehensive information regarding any technical problem facing an Indian manufacturer, besides such details as would usually be necessary. It may be mentioned that a straight request for "all available information in regard to....." can rarely be answered in a useful way but NPC would like to be helpful in every possible way.

5. A nominal reproduction fee of Rs 2.00 for each title of enquiry may kindly be remitted by bank draft payable to National Productivity Council, New Delhi. The service itself will be free and there will be no charge either for the copies supplied, except the nominal charge to cover reproduction cost.

SUBJECTS

Abrasives
Adhesives
Advertising and Sales Promotion
Air-heat
Appliances-Electrical and Gas
Batteries
Brick and Clay
Business Management
Casting
Ceramics and Glass
Chemicals
Cleaning
Coatings
Concrete
Construction
Corrosion and Erosion
Cottage Industries
Distribution and Marketing
Electricity
Electronics
Fibers
Food Processing
Fuel

Furs	Merchandising : Wholesale-Retail	Plastics
Garment Industry	Metal Fabricating	Plating
Hardware	Metal Processing	Plumbing
Industrial Development	Metallurgy	Printing
Instruments	Minerals	Production Methods
Leather	Miscellaneous	Rubber
Lubricants	Packaging	Safety
Lumber	Paints	Textiles
Machine Operations	Paper	Waste
Machinery	Petroleum	Water
Maintenance	Pharmaceutics	Welding
Materials Handling		Wood

LATEST TECHNICAL ENQUIRY REPORTS RECEIVED

(Copies of the reports are available from NPC at Rs 2.00 per copy)

Business Management

IR 12399 —*Office Management, cost studies* : 6 case studies relative to the application of cost reduction techniques in office management. One of the studies provides a specific example of economy achieved through changes in organization of a branch of a government bureau. The other 5 examples are from private industry.

IR 15692—*Salesmanship Training* : Reference and texts on salesmanship training are given. 6 references.

IR 15888 EP—*Training Programs* : A short bibliography is submitted on the training of management and personnel in retail and wholesale establishments. Eight references are given.

IR 16863 —*Personnel Management Course* : Prescribes a training course, 300-450 class room hours, outline course content and reference material.

IR 17068—A bibliography is given of modern office procedure with emphasis on up-to-date filing systems. 11 references.

IR 19410 —*Standards, Bibliography* : Information is given on a bibliography relating to standards and specifications for use in the drafting of legislation.

IR 19521 —*Organization and Training in Sales Department* : Information is given in detail on the organization and functioning of a sales department, (Marketing Function), and on salesmen training.

IR 19523 —*Bank Personnel Training* : Information is requested on the best system used by US banks in the training of personnel by use of written manuals. Because of the lack of published material on this specific topic most of the information furnished was gathered through discussion with men in the field. General background information was obtained from the bibliographical sources noted.

IR 19576-EP—*Employee Benefits* : Information is presented on employee training and employee morale building, with particular reference to plant air conditioning and in-plant feeding facilities. 12 references.

IR 19625 —*Office Layout-Personnel Department of a Bank* : Information is presented pertaining to a logical (i.e. profitable) office layout for the personnel department of a bank with 2,000 employees (1,500 of whom are in the main office). Personnel increase is a factor in planning.

IR 20012 —*Planning Private Investment Programs for Undeveloped Areas* : Information given about sources of information on the subject, and examples of specific programs in operation listed.

IR 20065—*Training* : Information is presented on techniques used in "quick" or "accelerated" industrial training programs. 2 references.

IR 20363 —*Employee Training* : Information is submitted on the training of industrial personnel, with particular reference to employees in the refrigerating industry. 7 references.

IR 20433—*Employee Stock-Buying Plans* : Information is given on plans used by US companies to encourage real participation by employees and workers in the companines activities by encouraging them to but stock on an advantageous basis.

IR 20481—*Tourist Agencies*: Sources of Information on the organization and operation of a tourist agency are indicated. A correspondence course is cited. 5 references.

IR 20621—*Cost Accounting*: A comprehensive source of information on cost accounting and other business practices in the chemical engineering industries is cited. 1 reference.

IR 20735—*Job Organization—Electrical Engineering and Generating Plants*: Information on planning organization direction, coordination and control with emphasis on 1) the organization chart, 2) job specification, and 3) the organization manual.

IR 20739—*Job Organization—Open pit Mines*: Information given as to technical texts on the subject of job organization in open pit mines.

IR 20963—*Use of Aptitude Tests*: Information is given on the use and value of Aptitude Tests in the selection of trainees in the mechanical industries.

IR 20979—*Music at Work*: Several general texts on industrial psychology are cited, plus a selection of articles on the roles of color and music at work. 38 references.

IR 20981—*Modern Cost Accounting Procedures in a Machine Tool & Die Manufacturing Plant*: Material on the general subject of modern cost accounting procedures in a machine tool and die manufacturing plant. 12 references.

IR 21036—*Bibliography on Business Finance*: Sources of information given on the general subject of methods of financing US business, making available to US Point IV, and ICARE libraries abroad, bibliographical material to serve as a basis for selecting items to be included in those libraries.

IR 21041—*Structural Organization of Industry*: Information given on trade associations, vertically by industry; structure of associations; selection of officer and directors; staff organization and bibliography.

IR 21188—*International Finance Corporation*: Information is given regarding the International Finance Corporation's use of convertible debentures as instruments of obligation.

IR 21403—*Export Promotional Organization*: Various publications are given on three sources of information on the subject of Export Promotional Organizations.

IR 21483—*Techniques of Successful Foremanship*: Description of the techniques and traits characteristic of the successful foreman is given.

IR 21491—*Selecting Office Workers*: Information is given on the techniques and procedures generally used in selecting office workers.

IR 21632—*Job Descriptions*: Information is given on job descriptions for hourly rated power plant classifications.

IR 21643—*Mining-On the Job Training*: Course description; reference and literature and usual material. Outlines of coal mining and machine maintenance extension courses are included.

IR 21689—*Wage Incentive Systems*: Sources of current information on wage incentive systems are indicated. 7 references.

IR 21949—*Retirement Plans in American Industry*: Information given on American Industries experience in the use of retirement plans. 2 references.

IR 21974-EP—*Technical Information Services*: A brief description is given of some organizations offering technical information research services on a fee basis, and a manual is cited listing a number of such organization and services in the US.

IR 22041—*Organization and Operation of US Insurance Companies*: Information on the organization and methods of operation of insurance companies operating in the fields of life, accident, casualty, and weather insurance.

IR 22177—*Organizational Methods in a Modern Shoe Factory*: Information given on organization methods in a modern shoe factory with emphasis on work flow and serial production. Bibliography included.

IR 22885-EP—*Job Analysis*: Four publications on job analysis are cited relating to job analysis and evaluation in electric utility companies (power plants, etc) in the US.

IR 22908—*Management*: A bibliography on organization and management in small business is provided, including 10 books and 32 articles.

IR 22950—*Food and Food Products*: A bibliography of 19 references is supplied including general reviews of the technology as well as selected new developments.

IR 22955—*Office Management and Procedures*: A bibliography is provided of 10 references on office management, 4 periodicals in the field, and 4 books on letter and report writing.

IR 22956—*Motor Transport*: A bibliography of 30 references covers management in the motor transport industry.

IR 22346—*Management*: A list of publications is given, covering theory and case studies of American methods of management training and executive development. The list includes texts and specialized pamphlets. 16 references.

IR 23004—*Selection and Training of Workers and Managers for Production Plants*: Information is given on the methods used for training the workers in the production departments as well as in experiences in industry and in plants themselves and methods of selection of suited men for certain jobs.

IR 23085—*Training within Industry*: Responsibility of management; duties of training instructors; outline of typical program is given.

IR 23343—*Mechanization*: A bibliography is given on mechanization in administration, job organization and related questions.

IR 23592—*Management*: A bibliography was given, listing the major books and periodicals presently being published and sold in the US, dealing with the basic phases of Office Management.

IR 23707—*Coal Mining*: A bibliography is given on various aspects of the coal mining industry, such as unionism, and safety methods.

IR 23774—*Taxicabs*: A senected bibliography on various aspects of the Taxicab business—organization, management, maintenance and cost of operation.

IR 23933—*Organizing a Purchasing Department*: Information and background literature given on organizing a Purchasing Department including such functions as the methods and procedures for obtaining quotations, evaluating quotations, scheduling, buying, etc.

R 23973—Information on the Development of Questionnaires to analyze social conditions of workers and employees of firms.

IR 23974—*Music in Industry*: Work music—the benefits derived from work music are entirely dependent on the musical content, programming proficiency and technical skill of presentation.

IR 24301—*Absenteeism*: Describes the problem caused by absenteeism in the Plant. 11 references.

IR 24597-EP—*Executive Training*: Information on the Denver conference on business administration, 1959, with reference to training of managers and executives.

IR 20978—*Seating of Industrial Workers*: Describes how to increase the efficiency of workers by the use of better work chairs. Ten references are given.

IR 22861—*Educational Programs for Staff Members of Banks*: Describes various types of training programs for bank workers. Lists several American Institutions that provide this type of training.

IR 19976—*Cost Accounting-Standard Practices to Daily Operations*: Describes how US Trade Associations disseminate information on cost accounting to their members. Lists ten references and four sources of further information.

IR 19903—*Viscose Product Plant-Cost Calculation Plan*: Shows how to develop a plan for calculating cost of operation for this type of plant.

D-437—Hiring Handicapped Personnel.
D-568—Good equipment and personnel policies.
D-569—In-plant Training for technical know-how.
D-650—Industrial training programs for leaders.
D-651—Suggestion Box provides incentive for worker.
D-738—Training helps workers in shoe factories.
D-741—Physically handicapped employees efficient.
D-742—Simplicity makes in-plant training more effective.
D-833—Shortage of skilled labour is relieved by in-plant training.
D-834—Apprentices must be selected carefully.
D-835—Labour-saving methods utilize machine Capacity.
D-836—Employee newspaper helps develop cordial relations.
D-898—Simplification practice and standardization.
D-935—In-plant feeding system.
D-941—Industrial truck-drivers should be trained.
D-1042—Standardization eliminates waste of manpower.

D-1244—Apprentice training.
D-1246—Good personnel relations start with the shop foreman.
D-1247—For best results use standard procedures.
D-1345—The Joseph Bulova School of Watchmaking.
D-1346—Developing Technical Personnel at Hammermill.
D-1347—Job Tests and Production Personnel.
D-1422—Material Conservation.
D-1526—Training New Operators.

MATERIALS HANDLING

IR 20733—*Materials Handling*: Three references are cited relating to materials handling in plants making incandescent light bulbs.

IR 19862-EP—*Document Transportation*: Nine references on document transportation by mechanical and pneumatic devices are cited. Five US manufacturers of pneumatic systems, conveyors, book lists etc. are listed.

IR 18115—*Storage of Bulk and Packaged Items*: Information on efficient and economical storage facilities is presented. 15 references.

IR 20844—*Materials Handling in the Paper and Paper Board Industry*: One reference is cited on manufacture of paper boxes, with references to handling problems cited. 7 companies and their catalogs cited on palletizing and unitizing procedures and equipment.

IR 21398—*Materials Handling (in woolen Mill)*: Reference is made to a general materials handling manual, and to 8 articles dealing specifically with materials handling in a wool mill.

IR 21014—*Materials Handling in Wood Impregnating Plants*: Illustrative procedures are described and references supplied on materials handling in wood impregnating plants.

IR 20853—*Materials Handling*: Reference is made to 15 books and articles on materials handling with emphasis on transportation in iron and steel plants.

IR 16837—*Hydrogen Cylinders*: A standard on the safe handling and storage of hydrogen cylinders is cited.

IR 16536—*Corn Handling Equipment*: Information is submitted on the use of pneumatic equipment for the transportation of corn and other cereal grains on the farm and in industry. Advantages are cited. 9 references.

IR 22987—*Ice Cooled Cold Stores*: A bibliography is given on cold stores for the farm, emphasizing the use of ice.

IR 17185—*Materials Handling-Shipyards*: A bibliography on materials handling in the shipyard is presented, with additional general works on materials handling techniques and equipment. 7 references.

IR 18433-EP—*Truck Terminals*: A description is given of the New York and Newark Motor Truck Terminals. 7 references.

D-468—Book storage system for Sheet Metal.
D-472—Overhead Conveyor System.
D-474—Using Load Distributing Device to Move Heavy Loads.
D-476—Castered Belt Conveyors Speed Produce Loading.
D-484—A Conveyor System for Knitting Operations.
D-490—Refrigerated Milktruck with Mechanical Door.
D-525—Warehouse and Conveyor System Reduce Sugar Storage and Handling Cost.
D-526—Truck Handling of Palletized Milk Cases
D-540—Jigs and Guiding Tracks for Automatic Welding.
D-543—Versatile Materials-Handling Equipment.
D-544—Unusual Material Handling Facilities and Practices.
D-545—Proper Equipment for Unloading Log Piles.
D-546—Air Transportable Cargo Handler.
D-558—Brickyard Operations Improved with Fork Trucks.
D-580—Hoisted Crane Replaces Guy Derricks and Gin Poles.
D-594—Modern Glass Factory Utilizes Materials Handling Equipment to Speed Production.
D-601—Bin-Handling for Dry Food Ingredients.
D-621—Pram Rail with Cantilever Hoist for Weaving Room.
D-622—Install Larger Batteries to Increase Hoisting Speed of Fork Truck.
D-624—Cartoons of Yarn Operate Controls of Conveyor System.
D-626—Method of Handling Sheet Metal.
D-627—Zipper Conveyor for Ball Clay.
D-628—Shipping Oversize Equipment.
D-642—Cable Changing Truck Built of Discarded Equipment.
D-666—Apartment Builders Pump Concrete 1110 feet from ground to roof.
D-716—Mechanized Freight Handling.
D-718—Plant Wide Cruising System for Industrial Trucks.
D-719—Fast Moving Adjustable-Voltage Cargo Hoist.
D-720—Freight House Mechanization.
D-782—Layout for Mechanized Handling Installation Speeds Flow of Work in Woolen Mill.

PAPER

IR 21762—*Manufacturing of sandpaper*: Information is given on the manufacture of sandpaper including raw materials, processes, machinery and source of supply.

IR 23187—*Facial and Cleaning Tissue*: Information is requested as to raw materials, processes, and equipment for manufacturing of.

IR 15873—*Coated Papers*: Information on the coating formulations used and the technology appropriate for the manufacture of friction glazed, flint glazed and cast coated papers by the roller coating method or the spray technique.

IR 17506—*Cardboard Boxes*: The advantages of fiber containers over wooden shipping containers are indicated, with emphasis on lower cost and shipping weight. Publication covering fiber box styles and design, specifications, and manufacturing methods are cited. 3 references.

IR 18739—*Cardboard Impregnation*: Paperboard containers are made impervious to oils by employing impregnating agents or by employing laminating materials that are impervious to oils within the container walls. Several processes are described in the patent and periodical literature and are discussed in this Report.

IR 23738—*Bagasse for Newsprint*: Supplies information on the processes involved in this operation.

IR 21522—*Bagasse Paper*: Information is submitted on the various commercial processes used for the pulping of sugarcane bagasse for paper manufacture. Typical American manufacturers of suitable pulping equipment, and consulting firms in the field, are also listed. 7 references.

IR 17979—*Corrugated Papers*: A bibliography on corrugated paper and boxes is given including one book, one Plant Requirement Report, and 5 periodical articles. One company making corrugating machinery is cited.

IR 20845—*Paper Bags of Multiwall Construction*: Three companies and their catalogs are cited for equipment needed in manufacturing multiwall paper. A bibliography of 5 references is appended.

IR 21946—*Paper*: Manufacturers of papermaking equipment are listed, including those supplying equipment for producing corrugated boxes. 4 references.

IR 23616—*Paper*: A bibliography is given on papermaking, with emphasis on semi-chemical pulp production.

IR 21719-EP—*Paper Containers*: Information is presented on various aspects of paper bottle manufacture (production methods, materials used, production equipment, applications of such containers, etc.) 3 references.

IR 24256—*Stencil Paper*: Information on materials and manufacturing processes for making stencil paper.

IR 15226—*Paperboard Production*: A review is presented of the processes and equipment used in the production of paperboard products from pulp. 1 reference is cited.

IR 20843—*Corrugated Paper Box Manufacture*: Reference is made to a general handbook and a typical periodical. Companies supplying equipment for manufacture and roll transport are cited.

IR 15225—*Paper Manufacture*: Information on the machinery and processes used in preparing pulp for paperboard from waste paper and rags.

IR 15407—PR—*Paper Mill-Plant Requirements*: Construction and Engineering data for a paper mill capable of producing a specified quantity of newsprint and sanitary paper per day.

IR 24329—*Paper Standards*: Material from GSA and ASTM including standards and methods of testing.

D-567—Paper Salvage is Important in All Industries.

D-649—Neoprene is now being used to produce stronger and cheaper paper.

D-736—Asuper drive used with supercalenders gives more paper production.

D-737—New automatic winder for paper machine increases production.

D-830—It is cheaper to rebuild super calenders than to buy new ones.

D-831—Pulp mills find valuable source of material in lumber chips.

D-832—Speed and quality obtained from machine making paperboard.

D-933—Glass paper is stronger and provides better air-filter.

D-1033—Resin-impregnated paper plates resist grease and heat.

D-1134—Two Protective Packaging Products.

D-1135—Paper Slitting and Winding Machines.

TEXTILES

IR 5841—*Spools, Yarn*: Textile Spools or bobbins used in the manufacture of yarn giving a description matter of many of the various types spools used.

IR 22605—*Handkerchiefs*: Sources of machinery for the production of handkerchiefs are listed. 2 references.

IR 24360—*Silk Screen Ink*: Seven (7) references are given on the research and development in the screen printing color field.

IR 24180—*Spools*: Information given on manufacture of wooden and paper spools, the winding of cotton thread thereon, and labelling.

IR 16139—*Tie Fabric Production*: Information is submitted on a loom which can be used for weaving necktie fabrics. Prices are indicated.

IR 15868—*Tire Cords*: Information on the manufacture of nylon, rayon and cotton tire cords.

IR 23773—*Silk Screen Printing*: The hand method of silk screen printing is summarized, and US sources of equipment are listed. 10 references.

IR 24287-EP—*Production Control and Productivity in Cotton Spinning*: General references on production problem and productivity provided. 15 references.

IR 18685—*Cotton Classification*: One book, the specific title and Parts of the US Code, one US Government handbook, and 10 journal articles are cited relating to cotton classification, grading, and standards.

IR 18743-EP—*Nonwoven Fabrics*: A short review of the production of non woven fabrics is given. Four companies making the necessary machinery and three companies making the product itself are cited. 11 references.

IR 18927—*Printing of Cotton (Yarn Goods)*: Sources of equipment for printing cotton yarn goods are indicated. A bibliography of 9 references indicates sources of information on the techniques of printing on cotton cloth.

IR 11213—*Spooling and Reeling*: A rather complete description of a system installed at Avondale Mills, Sylacauga, Ala. and patented by the POM Co, Industrial Consultants of New York, whereby one man can supply 11 Foster reels with yarn is given.

IR 21649—*Textiles*: A bibliography and a list of journals pertinent to textile processing are presented.

IR 23628—*Textile Printing*: Sources of information and equipment are listed on film printing (silk screen printing) of textile fabrics. 21 references.

IR 16289—*Textile Industry Exhibits*: The development of successful exhibitions is discussed briefly.

IR 16033-EP—*Textiles, Pleated Cotton*: Information is presented on methods and equipment for durable pleating of cotton textiles. Name, addresses and catalogs of companies are included, one making fabric for pleating and two making pleating machinery.

(To be continued)

NPC TECHNICAL ENQUIRY SERVICE FORM

(No bank draft need accompany this form. Charge, if any, will be intimated later)

1 Name and address.

2 Size of operation: (a) If the inquiry is from an operating factory, indicate average annual production, average daily employment, shifts etc. (b) If the enquiry relates to a new plant, indicate proposed employment, annual production and ultimate capacity.

3 Products manufactured or services rendered: (Indicate specifically sizes, types and variety of items produced)

(a) Actual product pattern, if in operation

(b) Machines used (type, name, quantity)

(c) Proposed products, if new operation

4 The Problem: Describe in specific terms as far as possible the exact nature of the problem. If it relates to a new facility, describe in exact terms the information desired. If it relates to a current operating process, describe the process and equipment, in sufficient detail to identify it precisely and indicate the specific type of operating weakness to be overcome or the type of improvement which is desired.

BOOK REVIEW

REPORT OF INDIAN PRODUCTIVITY TEAM ON COTTON TEXTILE INDUSTRY IN USA, JAPAN, WEST GERMANY, FRANCE AND SWITZERLAND

Published by the NATIONAL PRODUCTIVITY COUNCIL OF INDIA 38 Golf Links, New Delhi. December 1960. Price Rs 3.00. 161 pp. illustrated.

THIS is *npc* report number 5 in the valuable series that the National Productivity Council of India has been bringing out for some time past.

The Report of the Cotton Textile Team has topical significance in view of the industry's modernization programme and the very urgent need to make its products internationally competitive. The Team had considerable experience, consisting as it did of four top executives, two experts who knew intimately the techniques of industry and last but not the least, a representative of textile labour. This pooling of varied experience has certainly added to the value of the Report, now published by the National Productivity Council. The diagrams and illustrations, interspersed in the body of the Report, show that the Team knew what it was about.

In a period of less than two months, the Team attempted to cover a fairly large area. Its terms of reference included management organisation, purchase and sales policies, plant organisation and plant maintenance systems, management control techniques relating to costs, budgeting, materials, personnel etc. Particular study was to be made of techniques adopted to improve labour productivity and plant efficiency in general with particular reference to (a) quality of raw material in relation to count (b) mechanisation of materials handling, automation, application of the results of research to industrial operations, training facilities etc. Standardisation and labour management relations also came within the scope of the Team's study.

The Report shows that within the limits of time and opportunities available, the Team tried to cover as wide a ground as possible. It even visited certain cotton farms in the USA to observe the salient features of cotton cultivation, ginning and baling. This shows the intimacy with which the Team pursued its objectives of study of various aspects of the textile industry.

Even countrywise, the coverage of the Team appears fairly large. The Team went not only to Japan and the USA, but also France, West Germany and Switzerland. The list of plants and organisations visited by the Team (Appendix A of the Report) makes quite an imposing impression. Very obviously, the schedule of the Team was tight by any standard, having had to visit plants of different types, some manufacturing grey cloth, others synthetic fibres, rayon,

hosiery, textile machinery etc. The Team did not leave unobserved the institutes of textile technology, experimental and research institutes and laboratories, training schools, not excluding even banks, the national cotton councils, stores, textile workers' unions and the like.

The Report of the Team is therefore exhaustive. It not only gives the general perspective of the textile industry in the countries visited, but it has also attempted an analysis of the economy of each country with particular reference to the development of the cotton textile industry. In Japan, for example, the Report covers the phase of war and the following depression, the post-war rehabilitation of the textile industry, its modernised organisation and the part played by cotton textiles in "an economy geared to export".

Similarly, with regard to the USA, the Report not only gives the statistics of output (USA having the largest cotton textile productive capacity) but also employment, consumption and an account of the depressed conditions in which the Team found the textile industry was, at the time of its visit. This, as also other parts of the Report, are well documented and graphically illustrated. The Team has cited at considerable length the report of the congressional committee on the problems of the domestic textile industry. The Report also covers textile wages, management personnel and new plant facilities in the USA.

The comprehensiveness of the Report is indicated by the whole of part II being devoted to survey of raw materials to which a reference has already been made. Likewise, part III deals very well, though in short, with manufacturing methods: preparatory processes, spinning frames, materials handling etc. On page 32 would be found an interesting reference to the shuttleless loom of which mass production is likely to commence shortly in the USA.

Three chapters need particular mention: personnel administrative practices, training facilities and application of research to industry: probably the country and the textile industry in particular would benefit considerably by the Team's findings in these three lines. The last chapter is probably the most significant, dealing as it does with techniques for increasing labour productivity. This chapter ends significantly with an enthusiastic endorsement of the French Plan of Action which resulted in an almost 100 per cent increase in the spinning productivity of the French textile industry and 61 per cent increase in its weaving productivity.

In the context of the above analysis, the Team's recommendations deserve serious consideration. In view of the importance of these recommendations, it is only to be expected that the vast directive and control mechanisms of the Government, the management of the textile industry and textile labour will all combine to accomplish a substantial reorientation of their policies, procedures and techniques so that the textile industry should be able to furnish for the mass of the people an ampler supply of one of the basic necessities of life at a cost within the means of the ordinary consumer, as also undersell competitors in the export market with a view to add, the best that the industry can, to the most scarce of all our economic resources: foreign exchange.

EXPLORATION IN MANAGEMENT

BROWN, WILFRED, EXPLORATION IN MANAGEMENT, published by Wm. Heinemann Ltd, 15-16, Queen Street. London, W.1., 1960, price 30 sh, 319 pp.

WHEN something goes wrong with a machine, a good engineer tries to locate the trouble in the design of the machine. When things go wrong in an industrial organisation, however, the management is inclined to blame everybody except itself and its organisation of business. In *Exploration in Management* Wilfred Brown shows that it is the objective approach which pays dividends in healthier relationships and improved productivity.

There are not many men who combine in themselves the theory and the practice of management, but Wilfred Brown has since 1939 been chairman and managing director of the Glacier Metal Company, a British firm which has won a world-wide reputation for its new approach to old problems. Few men in managerial positions are as objective as Wilfred Brown, or could write as he does of the supervisory system in his own factory: "We could see things happening in the shops, which were wrong; but in spite of orders given, even though accompanied by threats, these things continued in a manner suggesting organisational unclarity rather than original sin." How many in his position would have thought of it that way?

Many difficulties, writes Wilfred Brown, turn out to be a *function* of the social system of the factory. The executive set-up in any business is a social structure and therefore the nature and function of each role can be studied and made the subject of explicit statements. This is just what has been done at Glacier Metal Works, and an attempt has been made to define closely the terms in general management use. These definitions, once they have been accepted by the representatives of executives and employees (called *members* in this factory), are written into the Company Policy Document. In this way a glossary of management terms has been built up which is not only useful in training Glacier employees, but can be used for general training in administration, a field where hitherto there has been a singular lack of precision of thought, due to different interpretations of the terms used.

This book is to set down current company policy, as it has evolved from constant analysis and experiment, for the benefit of those working in the business, but the conclusions reached are just as valid for any other form of business organisation. Thus, early in the investigations which were carried out with the help of the Tavistock Institute of Human Relations (the body which was also responsible for the experiments at the Calico Mills in Ahmedabad), it was found that there were in fact four concepts of organisation:

Manifest	: the situation as formally described and displayed.
Assumed	: the situation as it is assumed to be by the individual concerned.
Extant	: the situation as revealed by systematic exploration and analysis.
Requisite	: the situation as it would have to be to accord with the real properties of the field in which it exists.

A little thought will show that these concepts may diverge considerably, and

the ideal situation is obviously one in which all are as closely as possible in line with each other.

An example helps to make the point clear by showing a Manager A with three subordinates, B1, B2 and B3. The last man is temporarily on loan to another manager and likely to stay with him permanently, though to the rest of the organisation he still appears to be responsible to A. The *manifest* situation is that A has three subordinates, but discussion with A will show that the *assumed* situation is that he has only two subordinates. Further analysis discloses, to the surprise of A, that some of the instructions he gives to B1, who is in fact a good deal older than B2, seem to go to B2 for execution. In effect B1 sometimes gives instructions to B2, though the latter is not his subordinate. This is the *extant* situation, and it means that B2 is sometimes acting as the colleague of B1 and sometimes as his subordinate, a situation which may give rise to psychological difficulties. The *requisite* organisation requires that A should reorganise his section so that in fact B2 receives all instructions from A alone. Such analysis can be applied to many situations, and will show up at once the discrepancies between theory and practice which so often cause problems of relationship.

Once it is accepted that the organisation of a factory is a social structure, then it is easy to see that changes in methods of production may bring about considerable changes in executive roles and the relationship of those holding these roles. A small technical change, for instance, may result in a manager, who was formerly in charge of a team of skilled men capable of working without close supervision, finding himself instead in charge of a much larger number of less skilled people, so that he will require supervisors and machine tool setters to help him keep the complex mechanised set-up going. These changes on the shop floor will have repercussions right through the organisation. Much ill-feeling and much spoiled work may result before the necessary adjustments to the new situation are made, unless it is recognised from the first that technical changes may require a different social structure in the factory.

Status is always a delicate subject, productive of much bad feeling in any organisation. It was found in the Glacier Metal Company that there was a tendency to assess status by the number of positions through which instructions from the Managing Director had to flow to reach the individual. Thus, if in a chart it could be shown that there were only three officers between executive A and the Managing Director, whereas, in the case of executive B there were five, it was immediately assumed that the status of A was higher than that of B, though this might not conform to the actual situation in terms of value to the company of the two individuals. The company has now adopted a measure by reference to a concept which has been rather awkwardly called the *maximum time-span of decision*. This means the maximum lapse of time between the taking of a decision by a person in a given position and the review of that decision by his manager or by some indirect mechanism. Status is now measured by responsibility; and responsibility is assessed by whether an executive decision is closely checked by another, or only reviewed directly or indirectly at some later date. All executive roles in the company are now allotted to one of five ranks, based on this assessment, and this new approach has reduced the pressure on management for upgrading of large numbers of roles which was very evident before.

To the question of communication between the various levels in a business, Wilfred Brown has brought fresh

and useful thinking. He has made it clear that there are different kinds of orders and that the same words "have quite different meanings according to the role occupied by the people between whom communications takes place." If a manager *advises* his subordinate to do something, it is as good as an order, but if his subordinate, *advises* his colleague, it is only advice for which he will not later be held responsible. But if the subordinate is asked his opinion and gives his advice to the manager, this is advice for which he can be held responsible if it leads to failure. Such shades of difference are not always recognised, but an understanding of them is essential to smooth working.

The weakest link Wilfred Brown finds at the bottom of the executive system, where there is often confusion surrounding the role of section supervisors, and their responsibility may differ from section to section. Often the result is that purely individual complaints are generalised and raised at a higher level, when they should have been settled by direct discussion between the immediate superior and the individual affected. When raised by representatives at higher levels they tend to gather unnecessary emotional pressure. Failure of direct communication at the lowest levels has given rise to the view that joint consultative committees are necessary to enable workers to make suggestions about work to management. This should not be the case, says Wilfred Brown, although he lays stress on the importance of the representative system in industry, which in his company includes even election of representatives of the most senior staff.

It is difficult in a review to do justice to the very practical approach of this book, which illustrates every point from actual experience. It is certainly a volume which should be on every managing director's bookshelf available for reading by all his executive staff.

Mary Sur

ONE TASK AT A TIME

George Washington Carver, the famed Scientist, told this story on himself. When he was young and ambitious, he prayed: "Lord, tell me all about the universe." The Lord looked down and replied, "Now, George, that is a pretty big order for a little guy like you. Why don't you think of something else?" So Carver prayed again: "Lord, tell me all about the peanut." Smiling, the Lord said, "Now, George, that is more your size." Dr Carver did important things with the peanut. He convinced the farmers of Alabama that in addition to cotton they could grow peanuts and other crops. Since then, the peanut crop has brought the South an income of 60 million in a single year. From the peanut, Carver made more than 300 products, ranging from salad oil to soap and ink. He concentrated on one task at a time, modestly added one achievement to another.

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