

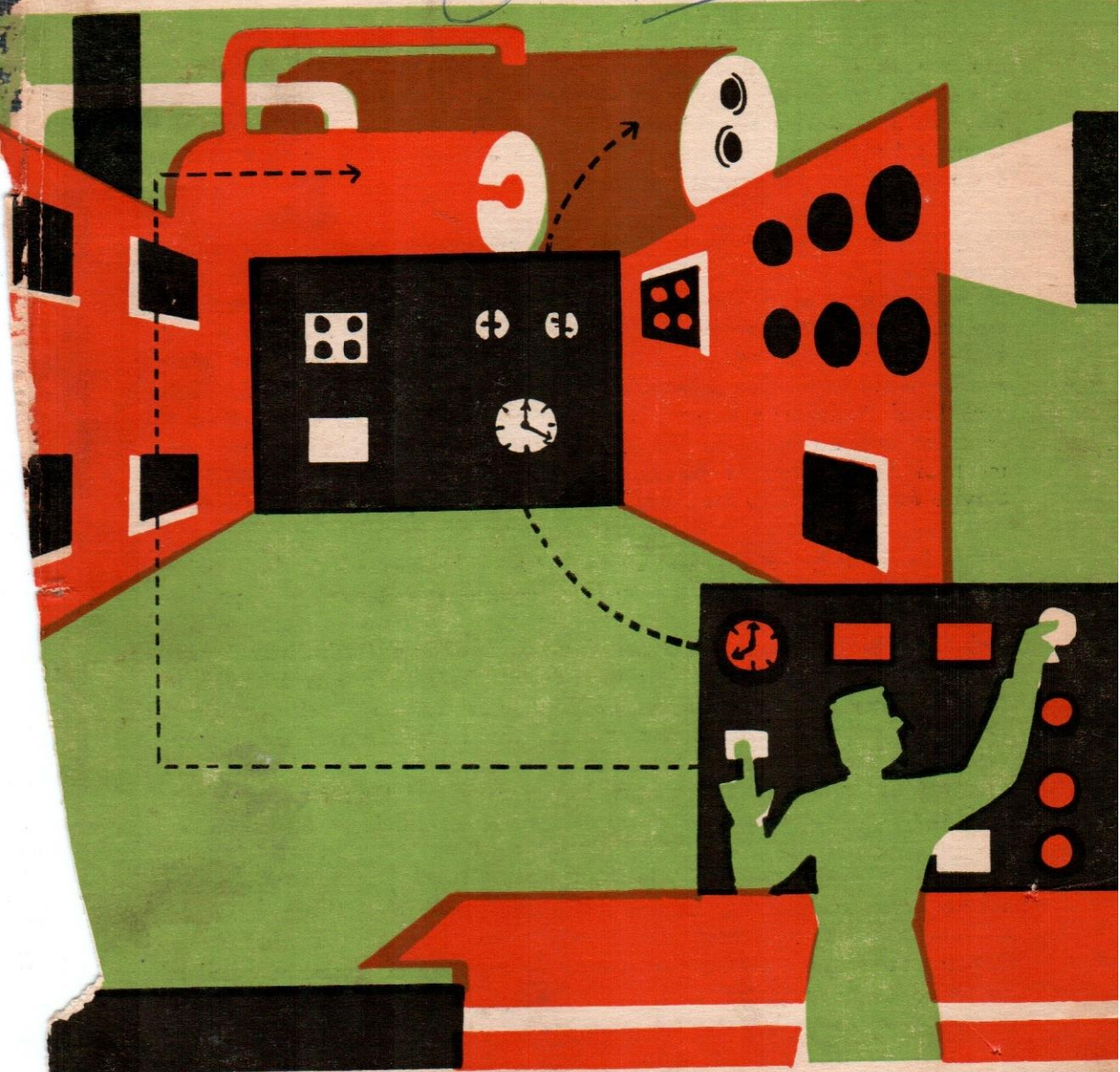
Vol. VIII, No. 1, Summer 1967

PRODUCTIVITY

(18)

NPC

Vol. 8 1967-68



NATIONAL PRODUCTIVITY COUNCIL JOURNAL

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. Forty-seven Local Productivity Councils have been established all over the country and they work as the spearhead of the productivity movement.

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.

Recognising that for a more intensive productivity effort, the training and other activities of NPC designed to acquaint management with productivity techniques, should be supported by demonstrations of their validity and value in application, NPC has decided to offer a Productivity Survey & Implementation Service (PSIS) to industry. This Service is intended to assist industry adopt techniques of higher management and operational efficiency consistent with the economic and social aspirations of the community. PSIS is concerned with the investigation of management and operational practices and problems, measures of improvement and their implementation. NPC has also established at Bombay a special Fuel Efficiency Service.

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.

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1. **Do People Work up to Capacity**—*Prabhakar Singh*
2. **Multishift Operation in Indian Industry**
—*Vinay P Bhende*
3. **Importance of Learning Curve in Industry**
—*Jyotirmoy Banerjee*
4. **The Anatomy of an Industrial Enterprise**
—*CR Wynne-Roberts*
5. **Materials Handling**—*RF Bruckart*
6. **Wage Incentive Payment Plans**—*William Gomberg*
7. **Introduction of Industrial Engineering
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Editor : D. H. Butani

Asst. Editor : L. K. Bala Ratnam

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I OWE . . .

To all men : a useful life, doing to everyone as I would have them to do to me.

To my profession : full competence in all work that I undertake; just treatment of my professional associates and adequate contribution to the advancement of learning.

To my client : an honest and finished job, the best I can do, always in the spirit of our agreement, regardless of compensation.

To myself : my self-respect and a clear conscience.

THE WORLD OWES ME . . .

Only what I earn.



TOMORROW IS A DAY

I speak of new cities and new people.

I tell you THE PAST IS A BUCKET OF ASHES

I tell you yesterday is a wind gone down,
a sun dropped in the west.

I tell you there is nothing in the world,
only an ocean of tomorrows,
a sky of tomorrows.

I am a brother of the cornhuskers who say
at sundown:

TOMORROW IS A DAY.

— Carl Sandburg

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(See Rule 8)

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I, DH Butani, hereby declare that the particulars given above are true to the best of my knowledge and belief.

Dated 1 March, 1968

Signature of Publisher

1 March 1968

Subject : Special Issues

Dear Reader :

May I, on this auspicious occasion of the Tenth Birthday of NPC, greet you as the Editor of this National Organisation engaged in the task of raising the levels of productivity throughout the social economy.

2. On this occasion, it is a matter of natural pride and pleasure for the Editor to be in a position to present the readers of the NPC Productivity Journal this Souvenir Volume on behalf of the NPC, a volume which contains several policy articles by the authorities of NPC, besides two special Issues, one on Coal and the other on Agricultural Productivity, and a lot of other valuable material. The occasion warrants that we deal out to the readers on a somewhat liberal scale.

3. The real fact is that as a Productivity Organisation, we operate on a rather slender resource base ; nevertheless it was the ambition of the Editorial Staff, in view of the fact that Productivity is now widely used as a book of reference, to continue the series of Special Issues, so as to furnish fully documented material on productivity techniques and concepts, not only to the Productivity Expert and the Business Manager, but also the university scholar and the researcher, the general practitioner and the industrial consultant, even the many large and amorphous groups that are now entering this rather exciting business of productivity.

4. We have so far published a number of Special Issues: Incentives, Personnel Management, Measurement of Productivity, Quality Control, Materials Handling, Work Study, Small Industry, Defence and Productivity, Cost and Budgetary Control, Operations Research, Productivity and Labour, Inventory Control, Productivity and the Engineer, Training, Interfirm Comparison, Preventive Maintenance, Human Relations, Agricultural Productivity, and Fuel Efficiency.

5. Even after the policy decision was taken to stop the Special Issues, on the ground that the general reader was being starved, we managed to continue publishing special sections; and in this series we published a large volume of material on Productivity in the Socialist State, Plays on Productivity, The Theory and Practice of Case Study, Suggestions Scheme, Watch Your Costs, Automation, Special Studies in Industrial Organisation, Applied Productivity, Models, Cost Reduction, Potentialities of Industrial Engineering etc. etc.

(Contd. on page 505)

PRODUCTIVITY

NATIONAL PRODUCTIVITY COUNCIL JOURNAL

The Consequences of Not Sharing the Gains

WITH THE publication, after several years, of the NPC Report on Sharing the Gains of Productivity, a stage has been reached where we ought to weigh carefully the consequences of not sharing the gains: for they can be pretty serious from the point of view of the national economy because productivity contains within itself the secret of a high growth rate. Without a marked increase in productivity, we shall be condemned to low standards of living and working in all spheres of the national economy. In fact, a vicious circle has been established in which no party is willing to make any significant move towards higher productivity, unless there is a prior agreement on sharing the gains. This vicious circle can only be broken by the Government, as the custodian of the national interest, with the primary responsibility for securing the highest practicable growth rate.

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

In order, however, that the paramount objective of maximum productivity may be rapidly achieved, NPC's Founder-President made a policy statement in **Productivity** (Volume I No. 4): "...On one thing I should be unequivocally clear, both as the Minister of Industry of the Central Government and the President of the NPC, that the first and prior claim on increased productivity must be higher remuneration for labour. We must write this in our industrial code, and make it clear both by words and deeds that the gains of higher productivity must primarily be devoted to raising the remuneration of labour to a fair wage level..."

It is seldom realised that our Constitution contains specific directives with regard to Sharing the Gains. In the Chapter on the Directive Principles of State Policy, it is said "...that the citizens...have the right to an adequate means of livelihood...That the operation of the economic system does not result in the concentration of wealth. The State shall make provision for securing...a living wage, a decent standard of life, and full enjoyment of leisure and social and cultural opportunities..." Thus, the Constitution itself lays down the guiding principles for Sharing the Gains.

There is, however, one snag that, of all the provisions of the Constitution, these Directive Principles alone are not subject to the jurisdiction of the courts. Very obviously this is an anomalous position that, while the whole of the Constitution is amenable to judicial interpretation and enforcement, the Chapter relating to the Directive Principles of State Policy is outside this jurisdiction. If the Directive Principles could be brought on par, in respect of justiciability, with the main body of the Constitution, then the judicial process could be brought into play with regard to Sharing the Gains of Productivity. In any case, since the Sovereign Parliament has resolved to make India a Socialist State, the Government is under moral obligation to satisfy the working class with regard to its share in the Gains of Increased Productivity.

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

In this context, it is imperative to point out that the current discussions regarding Sharing the Gains are vitiated by a rather serious misunderstanding. We have been discussing the problem as though the Percentage Sharing relates to a cake that stands right on the table, ready to be sliced and eaten; whereas the fact is that the Problem of Sharing relates essentially to a cake that has yet to be brought into being, whose very **recipe** is not yet settled. We appear to have clean forgotten that what we are discussing is Potential Productivity; and once this Potential is realised, the whole economy will stand transformed: it will, in fact, no longer be a question of percentages, for everybody will be so much the gainer personally as well as socially, as also in the general improvement of atmosphere and the social well-being that in the retrospect the current cattish debate as to how much "we"

should get and how much "the others" should not get, will look as childish as the one of division of 17 elephants by 2, 3 and 9! We really require a **vizier** (minister of Cabinet rank!) to add his own elephant, and then take it away after the Boys have had their share!

It is the potential of the economy that we have to think of, when discussing the Problem of Sharing. By and large, the people of this country on the average are not working more than 30 per cent of their potential capacity—whether they are men or managers, owners or directors, ministers or monitors, that's the average: a very few of **all classes** work very hard, but most of us work indifferently, and many (of all classes again) work negatively, so that, on the whole, the country does not get the benefit of more than 30 per cent of what we are immediately capable of. It is this immediate exploitation of the remaining 70 per cent of the Potential that the men of industry must look at, for it is **that Gain** that has to be shared; the 70 per cent that does not yet exist, but which can come into being, if we have the will and the character and the wisdom. Then it will be like a New Dawn in the Indian Social Economy.

As it is, the Gains are so small, that only a few can have the good things of life, a few more can be somewhat comfortable, but the mass of us are condemned by the very facts of the economy to a beggarly existence; and it is as beggars we are discussing how we shall share a full meal: who will get a full dish, and who will get half a dish, a quarter dish and will there be any, we ask with Johnsonian anger, who will get two dishes!

The Problem really is to create a "full-meal" economy and keep it perpetually filled up from the eternal reservoir of man's talents and capabilities: for even in the latest jargon of Economics, it is this Personal

5 Years Ago

... in the actual measurement of productivity in this country, we are treading a more or less virgin ground, despite **substantial** contributions by distinguished academicians. The reasons for this are partly fundamental and partly historical. Large-scale mechanized industry, taking the country by and large, is a matter of recent development in this country; and the science of work measurement has hardly been introduced except in a few concerns, which enjoy the advantages of modern management. Unless we measure work on the shop floor and establish (fair and reasonable) standards against which actual work performance may be measured, we would be far from accomplishing even the crude measures of labour productivity at any satisfactory level of achievement. Work measurement in its turn is a part of work study; and this we have hardly undertaken on any scale. This again leads us on to the dynamics of productivity, for those who have applied work study techniques have reported **startling increases in productivity, consequent on work simplification**...

From **PRODUCTIVITY**

Vol. III, No. 1

Capital that is the real Fountain of the Economy; and as it is, it has no share in the Gains of Productivity.

Even at what the economists call the micro-level—the level of the individual firm—the possibilities of exploiting men's potential through appropriate ordering of Sharing the Gains, can be graphically illustrated. Let us suppose the Delhi Transport Service have a fleet of 1,000 buses, each valued at say Rs. 50,000. Thus the total value of the buses will amount to Rs. 5 crores. These 1,000 buses become complete wrecks in two to three years' time, because of reckless driving, lack of personal attention of any kind, because they are nobody's property. Thus in a single year, we are wearing out this capital at say around Rs. 2 crores, which works out to more than Rs. 50 thousand a day; physical depreciation of this magnitude occurs daily, because we do not adopt even the most elementary policies—costing not a single paisa—to interest the drivers and the conductors in the proper maintenance of the buses. At least half of this amount, Rs. 25,000 per day, or Rs. 7½ lakhs per month can be saved, if we were to interest and educate our drivers and conductors in the proper maintenance of the buses. It would mean a saving of Rs. 90 lakhs per year: an amount which can provide funds for goodly maintenance of the fleet, for the education and housing and proper nutrition of the families of all the drivers and conductors and inspectors and even managers. This is the true Sharing of Gains.

Let us have a look at this intractable problem of Agriculture: the amount of money we pay by way only of freight on imported food. If this money were to be given as **incentive to real cultivators**, they would produce what we lack, and we would not have to beg or borrow from Uncle Sam; and the President's dream of ending dependence on foreign supplies of food would be realised sooner than the target date; otherwise, it will remain a chimera for many decades. The Great Nehru—with his insight into the secret of life—said time after time that we set a date for a total ban on imports of food grains. We did not accept the challenge and we continue to suffer and weep and whine; yet it is this appropriate Sharing of the Gains—our refusal to look at it squarely—that is at the bottom of the Failure in Agriculture; for the gains in one way or another are taken away by market manipulators, moneylenders, intermediaries of all kinds, petty officials at all levels: why should the cultivator put in his best, until and unless he is assured of a reasonable share in the Gains of Productivity!

Thus have we the alchemy by which we can alter the face of the country's Economy: all that is required is that men in power—whether it be Government or Industry or Trade Unions—think, as Nehru used to say, a long time ago, of the Country First, and Ourselves A Long Way Behind.

**(A two-page write-up on the NPC Report on
Sharing the Gains of Productivity appears
on page 117)**

Work Study for National Development

K Pennathur

WORK STUDY is essentially the appraisal of human aspirations, and the evaluation of human endeavour, in order to promote human satisfaction. Work Study is primarily concerned with human beings—their goals and objectives; their plans; their physical means of implementation; their cooperation and coordination with other human beings; their motivation and levels of satisfaction; their identification with and integration into the homogeneity of society.

Work Study cannot be applied to one individual in isolation or the organisation of which he forms a part, and of the society to which he belongs. Conversely also, Work Study cannot serve a society or an organisation till each individual who makes up the total image is taken into account. Work Study is, therefore, an integrated approach to the problems of humanity.

The proper climate for the growth of a society can be ensured only if three essential conditions are met, which may be summed up as:

1. The will to resolve problems

2. The ability to recognise problems
3. The wherewithal to find the right answers

The very first requirement of the will to resolve problems demands the right attitude on the part of the society, the organisation, and the individual. Pride, self-respect, enlightened self-interest, hope, ambition, and dynamism—all contribute towards the shaping of attitudes which seek developmental growth and social prosperity. Complacency, inertia, despondency, defeatism, and decadence produce negative attitudes which inhibit progress through Work Study. The most essential prerequisite for Work Study is the *right attitude at all levels*.

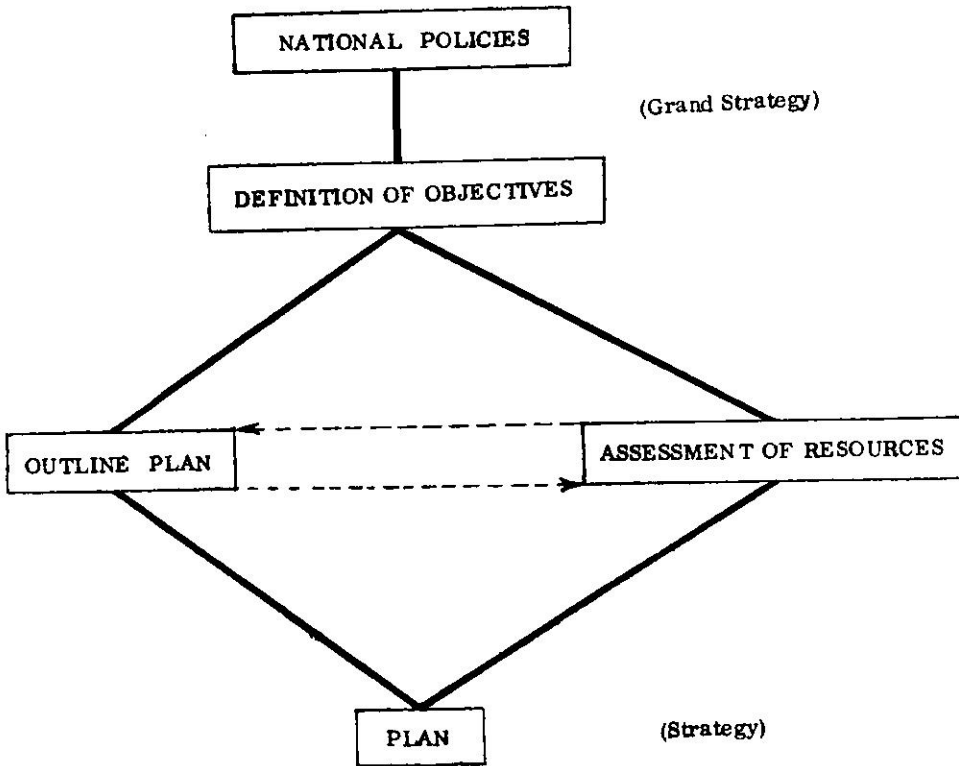
Work Study provides the basis for the other two requirements, i.e., *the ability to recognise problems*, and *the wherewithal to find the right answers to problems*. Work Study cannot create right attitudes. But, given the proper climate of right attitudes, Work Study will flourish to pave the way for progress and prosperity. Its innumerable sub-disciplines and techniques will help locate problems and provide optimal solutions to such problems.

Need for Application at National Level

In India, Work Study has not paid as much dividends as it ought to have, for two predominant reasons. First, it has been applied at the individual, and not the organisational or national, level. This application in parts, to the exclusion of the whole, has naturally not yielded appreciable results. Secondly, Work Study has been applied to inconsequential problems, and not to the really important ones. We have been concentrating on adjusting the strings of Nero's fiddle.

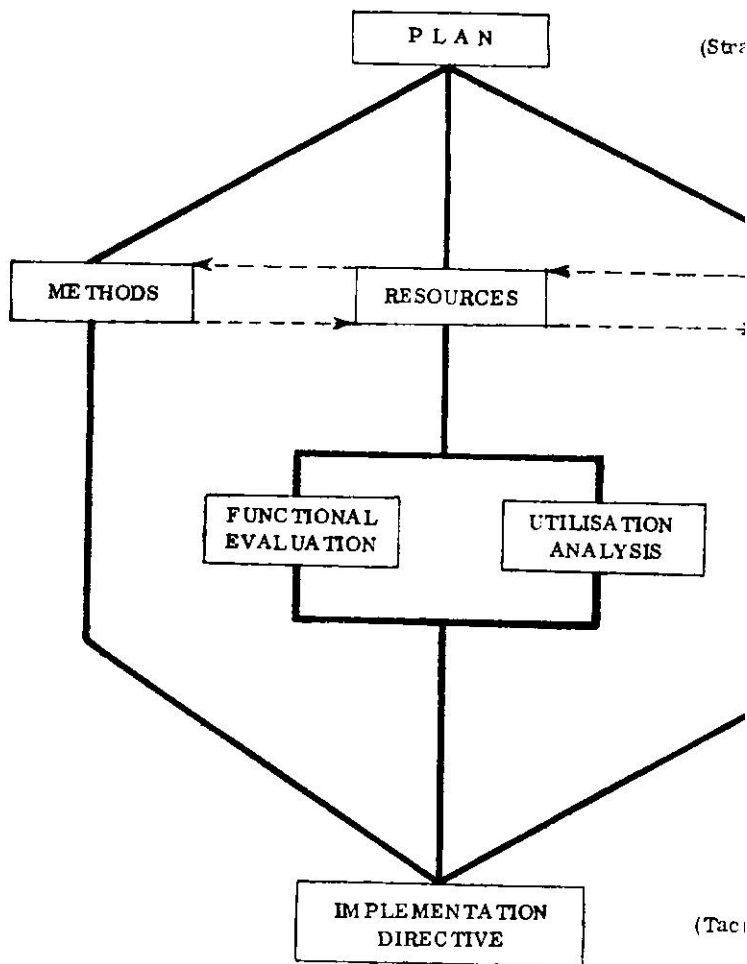
If Work Study is to make a contribution to the development and growth of the economy of any society, it must be applied at the national level first, transcending to the individual level through the organisational level. A society cannot drift passively. There must be national policies which enable the country's objectives to be defined and delineated in positive terms. The grand strategy of a nation can be best evolved through the application of Work Study. Once the objectives are determined, then tentative plans can be formulated, again through the application of Work Study. These tentative plans have to be matched against available resources and, by applying Work Study to evaluate the means, clear and well-defined plans can be set out. Work Study can thus make a great contribution to the formulation of the strategy of a nation.

Once the plans are decided upon, the methods of implementation have



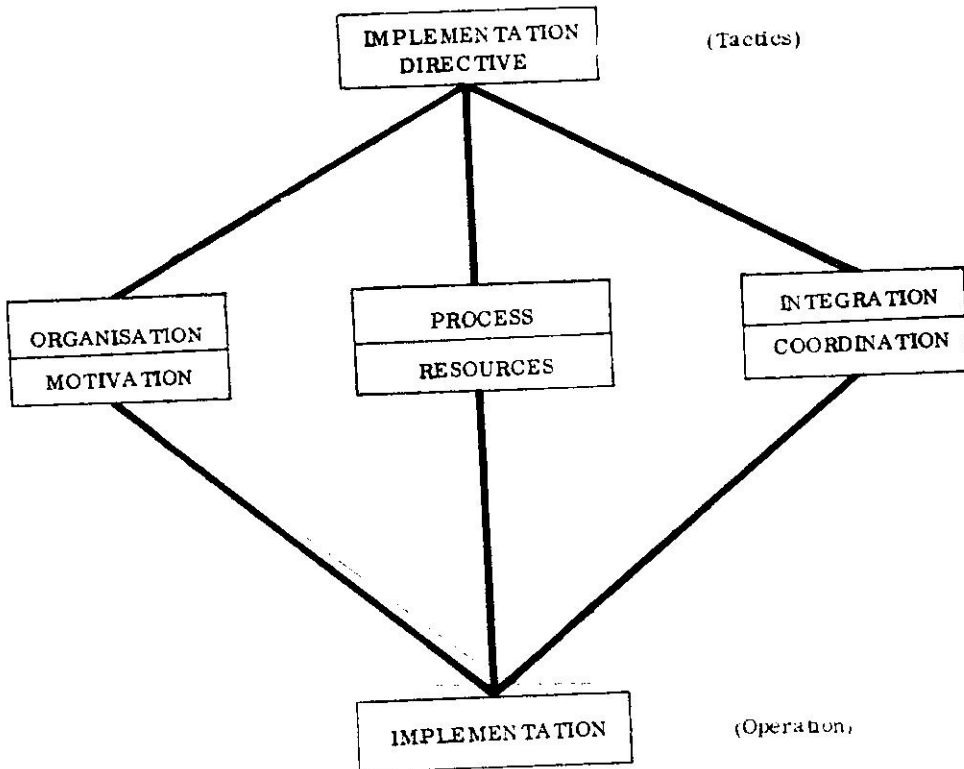
to be determined. The various alternative methods have to be matched against the resources available, and a suitable balance achieved. Resources have to be examined from two angles. Firstly, there must be a Functional Evaluation to determine the exact purpose the resources are going to serve. Secondly, there must be a Utilisation Analysis to assess the extent to which it is productively used. The plan has to be coordinated with other agencies operating in the same or similar spheres, so that duplication is avoided and integration is achieved. All these can be brought about through the vigorous application of Work Study in order to produce an effective implementation directive.

During the implementation stage, the type of organisation required, the motivation of the society and the workers, the physical process to be used, the detailed analysis of resources, and the coordination of the operation with those of the other agencies concerned have to be studied. Then only the implemen-



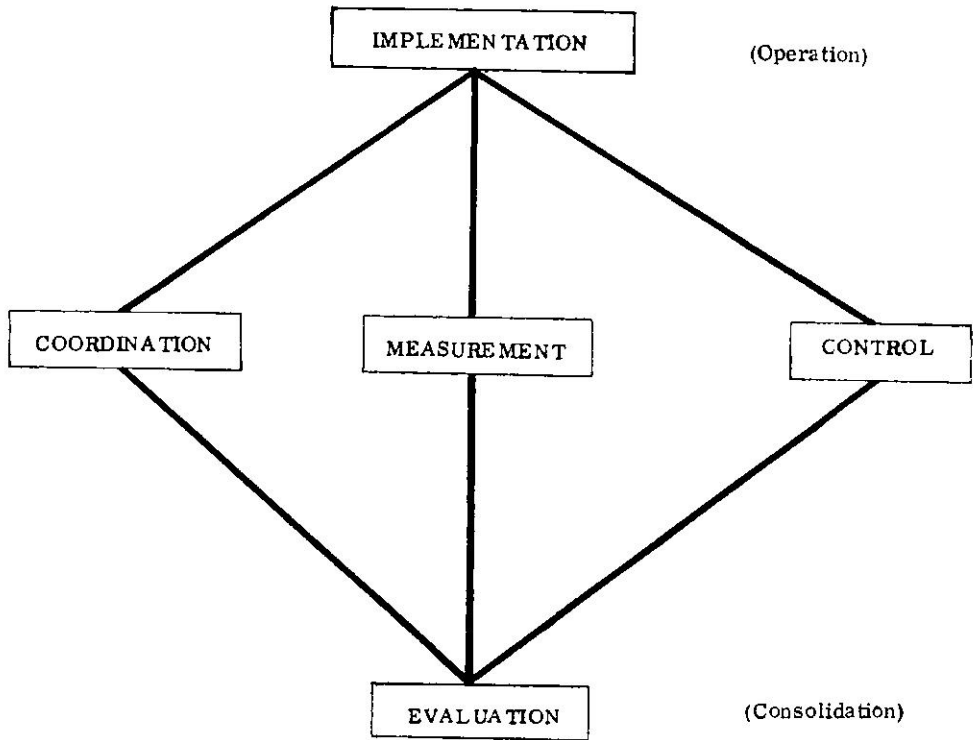
tation directive can be translated into a successful operation. Work Study is the most efficacious way of bringing this about.

During and after the implementation of the plan, aspects must be attended to, viz., coordination, measurement. These, if achieved through Work Study, render the evaluation quantifiable terms, the results of which can be made to : policies and plans.



On similar lines, but on a lesser scale, will be the application of Work Study to the problems of an organisation. The same steps have to be gone through. Only, the exercise will be restricted to a smaller sphere. Nevertheless, the individual organisations, whether they be farms or factories, whether municipal corporations or distributive trades, whether hotels or theatres, are the foundation of the social and economic activities of a society. The application of Work Study at this level, therefore, can have far-reaching impact on the resurgence of a nation.

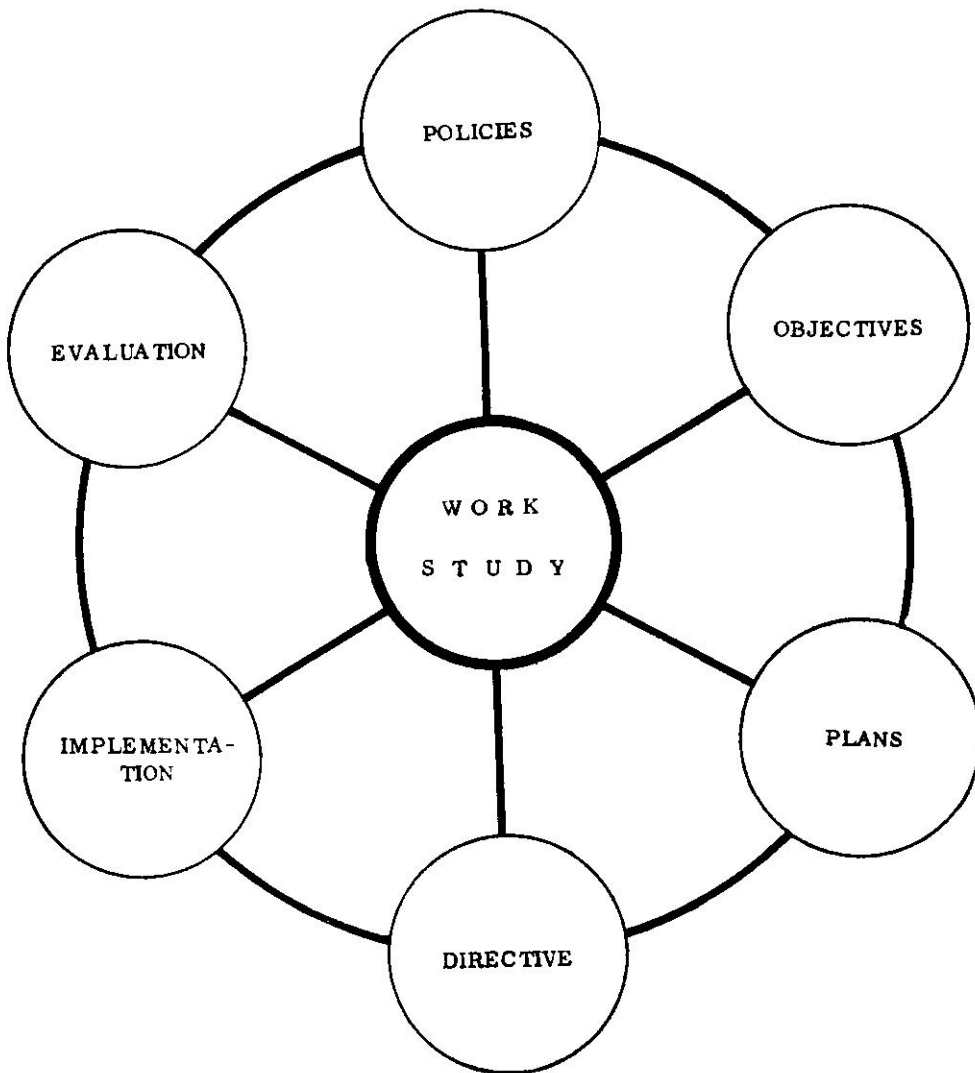
Each and every individual of the society has adequate scope to apply Work Study to his own problems. Once again the mechanics of application are the same, but the problems of an individual, from the point of view of others, is much smaller than those of an organisation or of the society as a whole. But, to the individual concerned, his own problems are very important, and Work Study can find satisfying answers for him.



The principle is clear. Work Study must be applied to determine goals and objectives. Work Study has a role to play in the evolution of plans. Work Study has to be applied in the physical means of implementation. Work Study must assume its rightful place in the evaluation of the achievement, so that we could have better objectives, better plans, and better means of implementation for the future. Work Study is, therefore, not a mere technique. It is part of Social Dynamics.

If Work Study is Social Dynamics, it has necessarily to absorb all the background disciplines and experiences. Work Study has, therefore, drawn a lot from philosophy, psychology, sociology, history, medicine, biology, physiology, logic, economics, mathematics, accountancy, statistics, engineering, electronics, and a number of other disciplines.

Work Study begins at the inceptive stages of evolution of objectives



and formulation plans. It is more economical and less frustrating to invest 20 paise in an India rubber to rub out a faulty plan on the drawing board than to invest Rs 20 lakhs in a concrete breaker to demolish an edifice built in a hurry and found unsuitable afterwards.

Work Study influences all functions of management—forecasting, planning, organising, directing, coordinating and controlling. It elevates the

status of decision-making from the traditional background of guess-work, intuition, and experience to the more reliable level of scientific evaluation and precise quantification.

Some Pre-requisites

Work Study permeates all social and economic activities—public health, social service, family planning, industrial safety, entertainment, catering, housing, education, training, job placement, career planning, motivation, social security, insurance, banking, agriculture, fisheries, mining, refineries, armed forces, public utilities, construction, purchasing, production, marketing, transportation, distribution, etc.

Let us examine the scope of Work Study at national level. National policies are formulated by the party in power, based on its ideologies. Quite naturally the policies will differ from political party to political party. Some may consider the change-over from English to a National Language to be of primary importance. Some may feel that the nation must have a comment to offer on all international matters. Some others may be of the opinion that there must be total prohibition. Yet others might feel that we must be a nuclear power. Where does Work Study come in? Admittedly, the policies of the Government are governed by the ideologies of the party in power. But a government cannot function in isolation from the masses who are governed. The Government must temper its ideologies with the needs and aspirations of the society. This is where Work Study steps in.

Quest for National Policies

In the quest for national policies, Work Study helps to crystallise what the objectives should be in consonance with the requirements of the society, and against the background of the party ideologies. Socio-economic, techno-economic and other surveys, opinion poll within the party, a study of the international economic trends, etc., help to record all the governing factors. These are examined against the context of social and economic needs of the society, the potential resources that would be available, compatibility with party ideologies, the degree of cooperation that would be forthcoming from other nations, and so on. As a result, national policies and objectives are developed. These are then implemented and evaluated. In other words, the party in power has gone through the following steps of Systems Study:

SELECT the problem for study (what should be the national policies?)

RECORD all governing factors

EXAMINE the relevant factors

DEVELOP national policies

It does not need elaborate surveys to determine a national policy which is of paramount importance today—that there shall be enough food for all the children of the motherland. This is one policy which cannot raise any ideological conflict among the members of any party, with the hypothetical exception of a party whose policy is to subjugate the society to the will of the party, and whose means is starving the masses into subservience. This exception has, however, no place in a democracy.

Given the objective that there must be enough food provided for all the citizens, the next step is to evolve the plans whereby the objective can be translated into achievement. Again, the processes of select, record, examine and develop, have to be gone through. The problem for study has been selected: how shall enough food be provided for all the people? The process of recording will make available all the governing factors and relevant data needed on the population, food preference, scope for change in food habits, types of soil in different regions, area under cultivation, current yield per acreage, comparative yield in other countries, resources used in the form of irrigation, equipment, seeds, fertilisers, pesticides, standard of farm management, problems of farmers, credit facilities, methods of farming, pattern of harvesting, storage, transportation and distribution, total food production, and quantum of wastage, for agricultural development, import of food grains, foreign exchange investment involved, etc. This process of recording of data might take weeks, if not months. The data is thoroughly examined from all angles, and then suitable plans are evolved.

At each stage it must be ensured that the different objectives are properly integrated, and that the plans of different objectives are properly coordinated. Let us assume that some of the plans for meeting the objective of 'food for all' are as follows :

- (i) Import food grains till we are self-sufficient
- (ii) Intensify the production of export-oriented agricultural products so that the foreign exchange earned could pay for the imports
- (iii) Promote awareness among farmers about the desirability of using fertilisers

- (iv) Concentrate on increasing the output of tobacco, groundnut, coffee and tea
- (v) Establish piggeries with integrated processing units.

These examples have been purposely chosen to illustrate the need for coordination, which is an essential prerequisite of Work Study. Plan (i), which is to import food grains till self-sufficiency is achieved, may be a sound one for the objective of 'food for all.' But there may be another national policy that, in order to sustain the pride and self-respect of the society, the nation should be self-reliant and not depend on the import of food grains. If this were so, then plan (i) will not be in consonance with the overall national objectives. Plan (ii) may be a sensible proposition. But implicit in this is an import programme which may conflict with another national objective. Plan (iii) is good. But if this were not coordinated with the fertilizer production or procurement programme, we would have only raised the expectations of the farmers without being in a position to make the supply when the demand comes, thus contributing to frustration among farmers. Plan (iv) calls for increasing the output of tobacco, groundnut, coffee and tea. In the case of tobacco, the capacity of the processing industry (e.g., cigarette-manufacturing enterprises) must also be correspondingly increased. The policy of growing more tobacco must not run counter to other objectives and plans. It could be that, in view of the cancer hazard, the Government's policy is to discourage smoking. If this were so, the Health Ministry would be campaigning against smoking, while the Agriculture, Industry and Commerce Ministries will be encouraging the sale of cigarettes! Similarly, in the case of groundnut, the processing industries (e.g. the vanaspati industry) must also be expanded correspondingly. In increasing the production for coffee and tea, it must be ensured that the promotional organisations for coffee and tea do not propagate against each other. Plan (v) for the establishment of piggeries must take into account the sentiments, food habits of the people concerned.

Implementation Directive

After a proper assessment of the resources to be used, and the methods and process to be employed, and after coordinating the plans with other agencies, an implementation directive has to be framed.

At this stage, a very important requirement of Work Study is to analyse what all could possibly go wrong with the implementation of the plan. Is there likely to be a delay in the supply of materials? Is there a possibility

of a strike in the dockyards or in the railways? Would the transport facilities prove inadequate? Is the monsoon likely to disrupt rail, road, or inland waterway communications? Would there be a tendency among stockists to hoard goods? What will be the precautions against failure of the monsoon? Would political or other factors influence, at a future date, the quantum of imports available from the other countries? All the possible factors that could affect the implementation have to be examined and adequate precaution taken against each.

The execution of the implementation directive will call for the application of Work Study with respect to the organisation needed for implementation, the motivation of the people, the processes to be used, the resources to be employed, and the integration of the various activities. The magnitude of the study would be getting smaller and smaller, but each stage of select, record, examine, develop, implement and evaluate has to be gone through. And as the study becomes smaller in magnitude, the depth of the study and the details gone into would be more and more.

In a minor aspect of the implementation of the overall plan, like the transportation of food grains from Bombay Harbour to Bihar State, complete working details will have to be studied for each phase, like unloading, temporary storage, transfer to rail wagons, transportation to destination, unloading, storage, preservation, transportation and distribution. In each phase, a small-scale Systems Study has to be instituted which will bring out the purpose to be achieved, the method to be adopted, the equipment and other facilities to be used, the mode of transportation, the time schedules, and the work force needed for the task.

During and after the implementation, the process of evaluation has to be instituted to serve as a feedback for future policy-making and planning. Control Measurements would have to operate at all stages from 'select' to 'evaluate.'

It will thus be seen that Work Study can be effectively and efficaciously applied to all national activities. In fact it is the right of every citizen to insist on the application of Work Study to all governmental activities, so that maximum benefits can accrue to the society with the minimum expenditure of resources.

An ineffective and inefficient enterprise is a liability to the workers. There is no security. There is no scope for higher earnings. There is no pride in belonging. There is not even satisfaction at work. Similarly,

ineffective and inefficient administration—at whatever be the governmental level—is a liability to the society. And for the same reasons.

Work Study can transform a dispirited individual into an enthusiastic member of the community. Work Study can render a stagnant society into a renescent one. Work Study can lend a faltering nation resurgent dynamism. Work Study is not only Growth Economics—it is also Social Dynamics.

Let us prosper the Work Study way.

Discover, Reduce, Avoid

Dr Manfred Knayer, ILO Expert on Work Study, in a speech in Bombay on "Higher Profits through Waste Reduction", said: "In every factory, we find a certain amount of waste, spoilage, defective parts, and unnecessary scrap. Some of it may be unavoidable, but often amazing reductions are possible with moderate effort. In some plants, people are so much accustomed to scrap lying around that they no longer stumble over it. In other cases, systematic studies will be necessary; they always pay. Graphical presentations, such as flow charts take some time to be drawn up, but they guide us when looking for hidden important details. Methods Study, usually done for work simplification and improvement, may be directed towards waste reduction. We may go even further up and ask the designer whether he has tried everything that allows to make our product with as little material as possible.

"One of the first steps should be critical analysis of the product in view of a better material utilisation. Sometimes, a change of the process, of a tool or a die, of the layout of the work place may become necessary; quality and production control can also help to avoid errors and defects...In an enterprise cost and waste reduction programmes should be arranged at least once in two years..."

"Discovering avoidable waste is only one of our steps, the next one is to control and to reduce it. Sometimes, a few friendly words, a quick adjustment of a tool will have an immediate effect; usually some write-up must be done, even more if we want to measure the results of our action. Then, incentives based on material utilisation can be introduced to reward the careful worker..."

Publicity & Comparison of Productivity

DAVID HARTLEY

WE ARE repeatedly exhorted to increase productivity and although it was announced at the national conference on productivity that there is no intention to initiate a new publicity drive, it was proposed that companies should publish information to show their progress and that international comparisons should be made in various industries.

But how?

No authoritative guidance is given or formula suggested to enable companies to compare progress with one another on the basis of facts; yet it is an accepted concept that comparison can be made only if facts can be expressed in figures.

Productivity is defined as the ratio of output to input.

$$\text{PRODUCTIVITY} = \frac{\text{OUTPUT}}{\text{INPUT}}$$

Comparison must be expressed from facts that are readily available without wasting effort, which would, in turn, reduce the productivity of the team. Two sources of facts can be used to compare productivity, time and money.

In companies where work measurement is combined with cost controls the figures can be used to compare the productivity of labour but information is usually prepared only on a departmental basis.

In the majority of organisations facts are available in the form of Balance Sheet/ Profit and Loss Accounts.

* In a letter to the Editor (printed as an Appendix to this article) the author has insisted on the readers of this Journal to join the discussion on Productivity, initiated by him; and he promises to provide a follow-up to stimulate interest. We ourselves would be interested in a continuing discussion and though we are hard up for space, this is a subject for which we would liberally provide. Productivity is our business!—Editor.

Work Measurement

Work Measurement is used to obtain standard times from which performance may be calculated. Performance may be quoted either as a percentage (100/133) or as standard minutes per hour (60/80).

Productivity can be compared in the production of two identical articles by quoting the time, for example, 10 standard minutes at 133 per cent in one factory or 8 standard minutes at 64 standard minutes per hour in another factory. In both cases the actual time taken is $7\frac{1}{2}$ minutes per article or 8 articles per hour.

Doubt immediately arises over the work study rating, allowances or differences in specification of the methods used in manufacture. Added difficulties arise in the comparison of different articles with different operation layouts and it would be impractical for multitudes of individual standard times to be published or compared factually.

The only practical comparison would be the gross cost of a standard hour and productivity expressed in standard minutes per hour. Reasons for differences caused by wage rates, overheads and excess costs such as sub-standard performance, down time and rejects could then be discussed to obtain a comparison.

However there can be no increase in productivity even when personnel are redeployed after their work has been studied unless the whole organisation can be shown to have benefited and the economics passed on to the community either by stabilised or reduced prices.

Company Statistics & Accounts

Common statistics such as 'tons per hour' or 'shillings per yard' etc, are difficult to reconcile against standards for the comparison of the productivity of labour, materials, machines, accommodation and administrative costs.

Turnover or profit do not reflect productivity because of the element of bargaining and effect of market conditions in arriving at the price at which goods are sold.

The effects of extremely inefficient production can be more than offset by brilliant salesmen; or conversely, a poor sales force will not provide adequate volume for the overheads to be reduced for the product to be competitive. Profit depends entirely upon the skill of management and accounting practices involved. For instance money may be paid out as salaries or dividends; or excessive wages may result in a loss being declared.

Many managements do everything within their power to prevent the compilation and publication of any information by which they may be compared and criticised under the cloak of excuses such as 'security' or that *it is impossible to compare oranges and apples, tractors with toffee or 1866 with 1966*.

Objective of Business—To Make Money

There is a tendency to forget that *organisations are not set up to make boats or sell buns but their main objective is to make money*. Money is the common yardstick which gives the same basis for comparison of productivity today as a hundred years ago, in any country in the world, despite devaluation or the actual name given to the currencies used in the calculation.

Goods and services are produced and sold primarily to provide an income for the business and its employees. Their income will depend entirely upon demand for those goods and services and the income of their customers.

Income creates expenditure*. The income of one person is the expenditure of another—either on goods and services or

* This is un-Keynesian. Expenditure does create income; but the reverse is not true, for all income need not be wholly or even partially spent!—Editor.

put to work in the form of savings. Further income may be obtained by the loan of savings to businesses when additional productive capacity is required to meet demand. Business offers employment, to those willing to be employed, so that demands for goods and services that can be provided by their organisation may be satisfied.

A general rise in incomes does not provide an increase in demand because the cost of production increases and there is no greater ability to pay for additional goods. Conversely, if incomes are reduced and prices reduced then expenditure is reduced and demand remains at the same level**. Thus a rise of incomes does not create an increase in employment unless accompanied by stability or reduction of prices so that income can be spread over a wider variety of goods and services to provide demand, employment, income and expenditure in other industries.

Reduction of unemployment by spreading work amongst a greater number of people by such devices as a shorter working week for the same individual incomes only increases prices. Any such rise in prices imposes a decrease in ability to pay by old age pensioners, the retired, and those living on fixed incomes resulting from the investment of savings that were earned while they (or their forbears) were employed.

Income and Savings

Income is derived by businesses (or the government) borrowing savings when additional money is required to provide equipment or buildings to meet increased demand. If there is no increase in the demand for goods and services there will be no demand to borrow savings. Therefore the loan of savings must be spread over an increasing variety of businesses to provide a rise in

the purchasing power of incomes.

In order that the community as a whole may enjoy a real increase of purchasing power there must be a real increase in the ability to pay for additional goods and services.

This can only be achieved through an increase in the productivity of money. The output of incomes to the community must increase compared with the input of savings borrowed from the community.

Productivity of Money

Thus a definition of productivity, which is universal, is the ratio of output of incomes to the community to the input of savings borrowed from the community.

This productivity index can be applied to any organisation for which normal accounting procedures exist, whether they be companies, government departments or privately owned businesses.

$$\text{PRODUCTIVITY INDEX} = \frac{\text{OUTPUT}}{\text{INPUT}}$$

$$= \frac{\text{Income paid TO the Community}}{\text{Savings FROM the Community}}$$

OUTPUT is the contribution to the community in money paid out as wages, salaries, dividends, interest on loans, pension schemes, national insurance, rates and taxes. These are the expenses which provide the incomes of others, including the government and can be extracted from the Profit and Loss Account or summary of expenditure.

INPUT is the contribution of the community in savings for formation and growth retained as issued capital, loans, reserves and credit. These are the savings which provide money, equipment and buildings for the business and are the total liabilities as shown on the left-hand side of the Balance Sheet.

In a privately-owned business the productivity index would be expected to be high because the owner plans to obtain the

* Demand depends on expenditure. A reduction in expenditure must lead to a reduction in demand.—Editor.

. . . It is only by increasing the productivity of money and comparison with the achievements of others that progress can be determined and the future planned. Managements should give publicity to their productivity index, as an increase would provide an incentive to all employees, and show that the real purchasing power of money is being made to increase . . .

maximum income for himself and his family from the minimum investment of savings.

An unprofitable organisation will pay low wages, no dividends, no tax and may hold excessive credit, all of which will contribute to a low productivity index.

When additional savings are invested on a profitable and economic basis, the productivity index will rise and both wages/salaries and dividends can be given a proportionate increase whilst watching the incidence of tax.

Productivity will decrease if heavy expenditure is incurred through the introduction of a new machine requiring additional capital but less labour. Conversely any increase in wages, salaries, dividends or tax will show as an increase in the productivity index if the same amount of money is being used to run the business. Productivity will decrease if money is retained in the business unless production increases and more is paid out in wages, bonus, dividends or tax.

A progressive company with increasing

turnover and profits whether they be paid out as additional wages, dividends or tax etc., will be indicated by a rising productivity index.

It is only by increasing the productivity of money and comparison with the achievements of others that progress can be determined and the future planned. Managements should give publicity to their productivity index, as an increase would provide an incentive to all employees and show that the real purchasing power of money is being made to increase.

Increase in such items as taxes or rates and the necessity to retain money to carry these items would be readily demonstrated.

The effectiveness with which money was being used in, say, 1866 could be shown and comparison made with branches, different businesses and organisations in other parts of the world on the basis of these common facts.

Money makes money and savings must be employed to make an ever-increasing contribution to the needs of the community.

Calculation of Productivity Index

A business in any country, any currency x 1,000 or any magnitude

OUTPUT	1860	1961	1962	1963	1964	1965	1966	Forecast
								1967
Wages	6	60	63	70	78	80	90	90
Salaries	1	15	16	19	21	24	30	30
Director's fees	1	8	7	9	10	11	12	6
N.H.I.		1	2	3	4	5	6	12
G.N.I.				1	2	2	3	6
Pension scheme		3	3	3	3	3	4	4
Dividends	1	4	2	1	1	3	3	1
Interest on loan	1	2	2	2	2	2	2	3
Rates		2	3	4	6	8	10	16
Taxes		15	20	25	13	10	20	30
Purchase Tax		10	15	20	20	20	20	22
Total OUTPUT	10	120	133	156	160	168	200	220

INPUT	1860	1961	1962	1963	1964	1965	1966	Forecast
								1967
Issued capital	10	50	50	50	50	50	200	200
Pref. Shares		10	10	10	10	10	10	10
Debentures		20	20	20	100	100	20	20
Loans	10	10	10	20	20	20	20	80
P.&L. a/c		10	5	2	4	10	15	5
Reserves		80	94	120	100	100	100	100
Trade creditors		65	65	120	66	40	50	110
Tax due		35	45	33	30	40	40	50
Div. & Int. due		10	5	5	10	10	15	10
Bank overdraft		10	20	30	20	20	20	5
Total INPUT	20	300	324	410	410	420	490	590

PRODUCTIVITY INDEX

$\frac{\text{OUTPUT}}{\text{INPUT}}$.5	.40	.41	.383	.39	.40	.41	.37
Difference per cent			+	-	+	+	+	-
on previous year			2.5	6.6	1.8	2.6	2.5	9.7

APPENDIX

"...With repeated exhortations to increase productivity and international comparisons it appears incomprehensible that there is no universal and simple calculation that can be understood by all, and applied irrespective of the size or type of business.

"I have been applying such a method for some years past in financial appraisalment, and it was not until recent productivity propaganda that I realised its significance as a measurement of productivity of world-wide use.

"A copy of my paper on the subject is enclosed for your comments and possible

publication. I am trying to obtain examples from many countries so that I can reinforce my previously limited data that it is not the productivity of labour that matters, but the productivity of that common yardstick—money.

"It has been found necessary to include a paragraph on labour and work measurement, because of discussion provoked by its omis-

sion, but as generally concluded I repeat that a universal comparison of productivity is not possible on the basis of time.

"I have many personal connexions with India, having been born in Lucknow, and would have been the fourth generation to spend my life there running railways. As it was, my time terminated with four happy years during the war..."

Saw Dust Has Many Uses In Agriculture

Saw dust is widely used as a fuel or as packing material, and in ice factories for protecting ice blocks from melting, though large quantities of it are going to waste. Research in recent years has shown that it has many uses in agriculture.

Writing on this subject, Mr MA Idnani says: "Saw dust in fact possesses several properties which make it a valuable material for use in agriculture. Its high water absorption capacity can impart to light sandy soils the property to hold and conserve irrigation water or rainfall, and supply it gradually for the growth of crops. This is particularly of value in areas of low rainfall for standing crops to tide over drought and moisture strain.

"On the other hand, its incorporation in heavy clay soils can make them easier to plough and prepare for cultivation and retain them in better physical condition during the period of crop growth. Because saw dust contains a large proportion of lignin which is resistant to microbial decomposition, its incorporation in soil enables organic matter level to be built up and maintained over a number of years. This would be useful under the tropical conditions in our country where organic manures of the usual type like farm-yard manure and compost are burnt up and quickly lost. Application of saw dust itself, however, causes temporary difficult conditions for crop growth due to the high carbon contents. This can be effectively counteracted by adding some nitrogenous material along with it in sufficient quantity to meet the requirements of micro-organism that develop in large numbers".

Management Development, Industrialisation & Productivity

MOST OF THE DISCUSSIONS ON industrialisation of underdeveloped regions often tend to place too exaggerated an emphasis on the lack of capital for investment. The argument is overstressed again and again that, if only more capital were forthcoming for investment, the pace of industrialisation would be spectacular. This argument is not necessarily right, and more often than not is only partially right.

No one doubts the importance of the easy availability of capital in facilitating rapid industrialisation. What is not often emphasised is that it is only one of the many ingredients, and by no means the most important.

Overemphasis on capital has unconsciously created an unwarranted assumption that once capital is made available everything would be smooth sailing on the path of industrialisation. As a result, no serious attention is paid to the other equally important areas which have a vital role to play in development. In this

context we may list factors like natural resources, availability of power, transport, technical know-how, skilled and disciplined labour force, educational institutions and their levels, religious customs and traditions, social modes and institutions, political institutions and their stability and, above all, entrepreneurial initiative and managerial competence. The assumption that all these exist favourably is not often borne out by facts.

Let us take for illustration the situation that obtains in Kerala. In almost every discussion on Kerala's problems industrialisation is considered to be the panacea for the vexing problems of the State. The most serious handicap that is listed in this context is the paucity of capital for investment. One gets the impression that if capital were made available, Kerala could be industrialised in no time: industries would just spring up and flourish all over the State. A close look at the socio-political scene of Kerala does not warrant any such conclusion.

While India as a whole had three general elections so far, Kerala* has had double the number during the same period! In the 1965 mid-term elections in Kerala, over six hundred candidates were in the field and from the intensity with which the campaign was conducted, one may roughly imagine the total amount of money involved although the precise amount spent would never be known. Suffice it to say that it was a vast sum, if not colossal in magnitude. Even if a sizable share of this amount had gone into industrial or other productive endeavours it would have helped significantly the State's economic development.

Education

Let us take another aspect of the Kerala scene. Statistics show that Kerala is the most educated State in India. One may very well point out that literacy and education are not synonymous; yet it may be admitted for arguments' sake that Kerala leads the country in this field. The State spends the largest percentage of its revenue on education and this percentage is perhaps the highest in the whole country. With such a high level of education it is only natural to expect the people to enter various enterprising avenues and contribute to industrial advancement, in particular, and economic growth, in general. Curiously enough, there is no sign of it at all. Almost everyone who comes out of the educational institutions just looks for a white collar job. One can at the same time see a disproportionately large amount of scarce

financial resources of Kerala being steadily drained away to augment the already available general education facilities. For example, during the last one year alone over 600 new schools and 32 junior colleges were sanctioned. The total amount involved as cost of these institutions—land, building, equipment, etc., is indeed huge. Since most of it comes from the people, just as in the case of the elections, it is again another example of scarce capital being diverted from possible productive enterprises. Is it because those who are engaged in this business do not understand the implications of what they indulge in, or is it because the establishing of schools and colleges, like elections and electioneering, has become the other most important industry of Kerala?

Education has, indeed, an important bearing on industrialisation as well as productivity. It is an investment of great significance in any society. But in order to produce the right results it should be rightly conceived and properly executed, keeping in view the needs and requirements of the society and the stage of its growth. Even if education is very important in the development of an underdeveloped society, a poor State cannot afford to spend disproportionately for education, particularly in the context of scarce resources. And if the education that is provided at such great sacrifice does not directly and substantially help create the right attitudes towards productivity and industrialisation and consequent economic growth, such education becomes a sheer waste, a fad and a curse. Kerala's present situation seems to be very much this.

* The author wrote this before the recent general elections. His argument now becomes in a sense stronger. Thinking, however, in terms of Aristotle's fundamental categories, a sound economy can only function within the framework of a sound polity! Should we, therefore, not say that an investment, though unfortunately large, in setting up a democratic system in Kerala, is an essential element in the total cost of its economic development?—Editor.

The experience of the more advanced countries shows, whether they are of capitalist, socialist or communist persuasion, that industrial development demands a professionally-oriented managerial elite or class. It also shows that access to managerial positions must increasingly be based on merit or competence. And competence or

merit becomes ever more dependent on specialised professional training and experience. As a consequence the managerial class in the advanced countries inevitably tends to become 'an elite of competence' which means that education and training, rather than family ties or political connections or communal or religious affiliations, must inevitably become the principal avenues of access to its ranks.

Many studies in recent times focussing attention on the causes of slow pace of economic development in the newly independent countries have led to one major conclusion: the shortage of high-talent managerial manpower is the major bottleneck restricting a country's capacity for economic growth. Here are a few selected extracts only to illustrate the point.

According to Eugene Staley, in his *Future of Underdeveloped Countries*, "the low level of management skills is one of the chief obstacles to economic progress in underdeveloped countries; hence, measures to increase the supply of these skills should be ranked high among the strategic factors for promoting sustained economic advance".

"What is deficient is not the spirit of enterprise; but the experience of adminis-

tration.....", says Arthur Lewis (*Theory of Economic Growth*). "Even if capital is available from outside, the capacity to absorb it in many sectors of the economy is very low. It does little good to supply money to build plants if there are no skilled workers to operate them, no competent administrators to manage them".

Experts' Views

Max Millikan and W. W. Rostow say in their work, *A Proposal: Key to an Effective Foreign Policy*, "that one of the most serious bottlenecks inhibiting the development of absorptive capacity in developed countries is shortage of managerial and administrative skills."

With experience of over a decade in several under-developed countries, Joseph Stepanek says, in his *Managers for Small Industry*, that he learnt many lessons during this period. It often happened that plans could not be carried out because of a dearth of entrepreneurs, administrators or suitable organisations. The conclusion was inescapable that *good management is even more important for the development of small industry than are efficient and appropriate production technologies.*

Thus the shortages of high-talent

Proteins from Natural Gas

Bacteria have been successfully used for producing protein, the valuable food component, from methane or natural gas. Shell scientists carried out a research in Milstead Laboratories, Kent, using a number of dissimilar bacteria. These bacteria are easy to extract from the growth media, and are non-toxic. They were bred and purified from extracts prepared from a number of natural sources, including lake water and the soil from oil-bearing regions. These organisms were brought into contact with methane gas as a suspension in water. Ammonium Nitrate was found to be a satisfactory source of nitrogen for the bacteria. Enough proteins have now been produced for laboratory tests on rats. It is estimated that a ton of bacterial protein may be obtained from three tons of methane.

managerial resources limit a country's capacity to absorb capital, restrict its ability to attract capital and reduce the effective utilisation of the raw material and manpower resources which a developing country may possess. The same principle applies to the accumulation of high-level human resources for management. In other words, if a country wants to industrialise, it must somehow generate and accumulate a critical minimum quantity of high-level human resources and it must find the means of directing them into productive channels.

In this context, the educational system is of crucial significance. A country will not achieve economic development through high levels of productivity if its educational system simply produces a class of "intellectuals" who fail to enter productive activities. It needs engineers, technicians and managers, and above all the organisation builders required by productive industry and government. Unlike natural resources, however, managerial and technical manpower is not just "found" in its natural state. No country is intrinsically rich or poor in high-level human agents. They must be developed and since the process of development involves both education and experience in a wide variety of contexts and under diverse auspices, manpower planning and coordination as well as management development become an essential part of economic growth.

Among the developed countries the Soviet Union alone perhaps had a conscious plan for the development of manpower resources intended for an accelerated growth of industrialisation. A study of the Soviet educational system by an American Professor (Alexander G. Korol, *Soviet Education for Science and Technology*) contains the following observation: "With the inauguration in 1928 of the Five-Year Plans for rapid industrialisation, there followed a period of frantic experimentation with the

educational system. Sweeping orders, decrees and instructions followed one another in rapid succession. The objective was to mobilise, expand and channel the capabilities of the educational system so as to make it serve exclusively the planned needs of a State committed to industrialisation at any cost". Whether underdeveloped countries today adopt the drastic Soviet methods or not, they cannot afford to take the long time which other developed countries had taken for the generation of high-level manpower resources. They have to achieve the results in a relatively short period. Manpower planning, therefore, becomes a subject of tremendous importance in an underdeveloped society.

The most important generator of high-talent manpower is a country's educational system. The more advanced industrially a country is, the more heavily it draws upon the college and university products to fill up positions in the managerial hierarchies. This is true of the USA, the Soviet Union, Britain, Germany, Sweden, Japan, Australia and other advanced countries. It has become possible because of the tremendous growth of technical educational institutions in these countries.

In contrast, what one finds generally in the underdeveloped countries is the adoption, as major objective, of compulsory general education for all the children of school-going age. The elimination of illiteracy and the upgrading of the masses is an understandable and laudable goal. But this is often the product of a misplaced emphasis on education as a "consumer service". The assumption is that all persons are entitled to enjoy a certain amount of education, and it is a matter of national pride that all citizens of a country be literate.

But if one looks upon education as an investment in developing the most critically needed human resources, then top priority cannot and should not be given to mass

attack on illiteracy* but to the quickest spread of technical and vocational training which will help production and productivity. If this proposition is accepted, then the bulk of our primary and secondary schools should be converted into technical and vocational schools. It is also important in this context to emphasise the quality of technical and vocational training. If the quality is poor the employers will not feel happy to employ the products of these institutions. And quality can be improved by providing better equipment and machinery and teachers with some industrial experience and also by selecting students on the basis of aptitude. There should also be opportunity for the students to have some training on the job through collaboration with local industries, wherever such industries exist.

In the context of the peculiar problems of a State like Kerala, there appears to be little justification for multiplying educational institutions of a general type, whether at the lower or higher levels. Mass education should be thought of only as one of the components of the higher standard of living which industrialisation alone can make possible. The major concern, therefore, should be to develop the State's capacity for economic growth and the multiplication of those skills which are most critically related to economic development objectives. This calls for a drastic reorientation of the existing system of education, both from the point of view of its objectives and methods. Even if this means a certain delay in the achievement of the goal of universal primary education, it should be accepted as an inevitable result of the extremely backward economic conditions of the present. A poor country cannot afford to spend the bulk of its scarce resources for the spread of literacy and general education and in the process be-

come poorer and make the people more frustrated.* Expenditure on education should become a productive investment which helps better productivity and an accelerated pace of industrialisation.

*This statement needs careful analysis. What are the scarce resources to which the author refers? He has rightly brought down the traditional concept of capital from its classical pedestal. By and large, though probably, not explicitly said, the author implies clearly that **the people are the resources**; and the problem is to make them productive resources. How can that be done, without liquidation of mass illiteracy? Without minimum education, how can we find out really talented persons? How can a man discover his own talent, unless he receives some minimum education? In fact, the analysis in modern 'growth' economies is tending powerfully towards regarding literacy and general education as the more substantial source of productivity gains. There is, therefore, a contradiction in the expenditure of resources on liquidation of illiteracy, and the people becoming in the process poorer. Of course, they are becoming more frustrated: here the author is absolutely right; but the solution lies in treating Kerala as an integral part of the Indian economy. The educated manpower of Kerala can surely be used in the service of education and health facilities in several States of the Indian Union, where the local population cannot furnish the necessary educated manpower; and the difficulty of language is certainly exaggerated. People from all parts of India (particularly the South) have gone to distant corners of the world, and learnt other languages, just to earn livelihood. Why cannot we draw upon this excess of educated manpower in certain States to fill up the deficiencies in other States? Similarly, with regard to food: if Kerala grows plantation crops, which bring us foreign exchange, it should be able to draw for its food supplies on surplus States. The Editor is of the opinion that the solution to the problems of the country—and Kerala as a part of the country—lies along these lines. Just as the cure for the ills of democracy is more democracy, the cure for the ills of education is not less, but more, and of course, better education. The stress on quantity is inevitable in a heavily populated country, but it is much better that there be a little improvement in the lives of many than a substantial improvement in the lives of a few: we are a socialist country by the decision of the Sovereign Parliament.—Editor.

* Is not the one essential to the achievement of the second? How do we get the quickest spread of technical and vocational education without a mass attack on illiteracy?
—Editor

SIDAC in Japan

RAM K VEPA

*Managing Director
Andhra Pradesh Industrial Development Corporation*

The author was invited to attend the second SIDAC (Small Industries Development Administrators' Course) jointly sponsored by the APO and the Government of Japan. The course had 16 participants, 2 each from the 8 member countries—Iran, Pakistan, India, Thailand, Vietnam, Philippines, China (Taiwan), and Korea—and was conducted by the Japan Productivity Centre (JPC). Since the author was a participant, he had the opportunity of watching closely what transpired, of which this is an impressionistic account.

AFTER an initial briefing at the APO Headquarters, there was a welcome ceremony at the Japan Productivity Centre at which the participants were officially welcomed by the Managing Director of the JPC, and representatives of the APO, the Ministry of International Trade and Industry of the Government of Japan (MITI) and the Course Director, Mr. Akira Suzuki. The programme itself was broadly divided into four parts: the first part Orientation, the second Fact-Finding, the third Adaptation and the fourth Individual Study and Report Writing. The talks and discussions were held at the offices of the Japan Productivity Centre while lodging was arranged at the Asia Centre in Akasaka, an international house where costs are less than in regular hotels.

The Orientation programme was for the participants to get to know each other as well as the staff members involved in the

programme. The latter included Mr. Islam from the East Pakistan Small Industries Development Corporation, Mr. Kanayama who acted as an interpreter till Mr. Kunii took over, Mr. Shimittu and his assistants who made the necessary arrangements for the talks and the visits. The participants themselves had a varied background and represented considerable experience—many were involved directly in Government Programmes but some like the representatives of the Philippines and Vietnam were from the private sector. The second participant from India was Mr. Gupta who is the Secretary of the Small Industries Federation at Delhi. It was, therefore, somewhat necessary for the participants to get to know each other as a preparation for the more serious part of the programme.

Besides this purely personal aspect, the orientation programme was also utilised for acquiring a knowledge of the problems

of Small Industries development in the respective member countries. Each of the participant teams was required to make a presentation for an hour and half of the definition of small industry employed in his country, the stage of development and the problems faced by them. This was highly instructive as it enabled participants to see their own problems in a wider perspective and to realise that while there were differences due to cultural and social backgrounds, there were also broad similarities in the problems as well as the methods employed to solve the problems. The information was later collected in a chart form and analysed by the group as a whole so as to pinpoint the basic problems that were common to most Asian countries.

Fact-finding Aspect

The next phase of the programme was the fact-finding aspect and consisted mainly of talks and plant visits. Since we did not have a participant from Japan (although an attempt was made to secure one) it was essential to have detailed information on the state and problems of industrial development in Japan itself. The talks arranged covered a wide scope—they included general surveys and also specific problems on Marketing, Management Consultancy, and cooperation associations. The speakers were drawn from Government, the Press, independent associations, Universities, or Management Consultancy Organisations. Although there were some difficulties due to language, these were largely removed by the excellent and skilful translation of Mr. Kunii whose own background with the Kansai Regional Productivity Centre at Osaka was helpful. There were always free and frank discussions by the participants with the speaker and the talks were in most cases instructive and stimulating.

Also at this time were begun plant visits which took us to several plants manufacturing electronic products, industrial estates, machine manufacturing unit, etc.,

The visit to the Ashikawa Tricot Industrial Estate was extremely interesting in that it gave us a first-hand knowledge of the operation of such estates and the effective manner in which government assistance to such programmes was made specific and helpful. Each of the plant visits included an initial briefing, a tour of the plant and a subsequent discussion on some specific aspect. At Nikkyo Electric Company, for instance, we were largely concerned with the sub-contracting arrangements, the Company itself being a sub-contractor for an internationally reputed Company. One must also mention that in many cases, plentiful material (in English) of long-term value was supplied which gave us a further insight into the working of the Unit. In addition, each of the participants maintained notes to record his impression of the visits.

Although plant visits continued to be a feature of the entire programme, the next phase began when the team moved to the Chiba Prefecture about 20 miles away from Tokyo. With the knowledge acquired of the Japanese Industrial Development and the broad governmental policies, we studied in greater detail the application of these policies at the prefectural level and the organisation which was available for this purpose. We also visited a number of plants including an Iron Industrial Estate, Tanaka Motors, etc. Of special interest was the visit to the new industrial area being developed by the prefectural government by reclamation from the sea, on which new industries have been set up which included an oil refinery, glass works, chemical plants, etc. Our discussions with the Chiba officials were very interesting and we acquired a deeper knowledge of the problems of small and medium-sized industry. (Incidentally, we took a Sunday off to explore the Bozo peninsula and see some of the scenic beauties of the Pacific coast and the national park at Katsuro with its Waltzing flamingoes).

The Chiba visit was, however, only a

prelude to the Hokkaido study programme which began almost immediately after we returned to Tokyo. We were given ample reading material to study the general development of Hokkaido—the northernmost island, which has traditionally been an agricultural area but under pressure of a growing population; and the need to develop new resources is being transformed into a highly industrialised area through Six- and Seven-Year Plans. We flew to Chitose and drove to Sapporo city, about 15 miles away. In many ways, the Hokkaido trip, lasting for about 11 days would remain green in our memory for many years. It is hard to forget the warmth of friendship and hospitality we received from many people and the reception arranged for us by the local Productivity Centre where we were introduced for the first time to the delicacy of Genghis Khan Barbecue.

Plant Visits

There was a briefing session at which movies were shown of the prefecture and later a formal welcome session at which the Lt. Governor of Hokkaido spoke. Later we got down to the important part of the programme, and for this purpose were divided into 3 groups—each group to study one aspect of the development programme—one on general organisation, Government policies and programmes, the second on financing and the third on technical and production aspects. I was the Chairman of the third group and also acted as Coordinator of the three groups. There were talks by those actively involved in the development programme; there were also plant visits by each of the groups to institutions and plants as well as to the new and development areas near Tomokomai and Otaru. At the end of the visit, there was a formal presentation of the recommendations of the entire group by the three Chairmen on several aspects of the Hokkaido development plan. These involved a major reorganisation of the execution of plan programmes as well as changes in Government policies.

The recommendations were well received and favourably commented upon and although the difficulties in the acceptance of some of them were explained, it was recognised that they displayed a careful study and a deep understanding of the problem.

For participants, Hokkaido represented a close approximation to the stage of industrial development in their own countries and hence the problems and programmes seemed to have greater relevance to their home countries than the highly developed metropolitan areas of Tokyo and even Chiba. One must mention that it was with heavy hearts that we bid 'Sayonara' to Sapporo where we had met with so much friendship and affection.

Our return to Tokyo marked the "beginning of the end"—to use a Churchillian phrase—and the phase of individual study commenced immediately afterwards. Here again, for convenience, groups were formed, based on individual requirements, and visits were arranged to cover varied interests.

A certain amount of flexibility was provided so that each participant could choose any particular visit depending on his own specialised interest. Based on these visits and the general impressions gathered during the programme, a report was written up by each of the participants. This was presented at a day-long meeting held at the JPC at which representatives of the APO, as well as of the Government of Japan (MITI) and the Embassies were present. This presentation was the highlight of the entire programme and represented in a condensed manner the many impressions gathered during the past 8 weeks. This was followed by a brief farewell ceremony at which certificates were awarded to each of the participants for the successful completion of the programme.

During the 8 weeks we lived and worked together, the participants of SIDAC had become a close well-knit group and

new friendships were formed, cutting across national boundaries. It was quite common, for instance, to see the nationals of India and Pakistan moving in friendship, which indicated the primacy of human values; in many ways, such international programmes serve a deeper objective besides the purely obvious ones. With the staff of the JPC and particularly of the International Cooperation division, the participants were on easy, familiar terms. The course director, Mr. Suzuki, who appeared at first to be somewhat formal, had become friendly and the farewell reception held by the participants for the staff was proof of the high regard and affection they had developed for the JPC and APO staff. It is a safe bet that many of these friendships will survive long after the immediate objectives of the programme are attained.

The programme itself was useful and instructive in that it exposed middle-rank

executives from a number of Asian countries to the Japanese situation and enabled them to study first hand the motivation for what is often called glibly the Japanese economic miracle. But we learnt that the 'miracle' was in fact the end product of clear thinking, hard work and a devotion to duty which we found to a remarkable degree in management and labour alike. While many of the methods used by Japan may not be always applicable to one's own country, the awareness of such methods is helpful for adaptation for the specific needs of each country. And a study undertaken by a team of experienced persons helps to obtain a deeper understanding through discussions and exchange of ideas. It is a pleasure to record the unfailing courtesy with which we were received at the plants and the kind hospitality we enjoyed at most of them. It is also a matter of pleasure to recall the helpful attitude of all those who

'Standardisation Alone can Reduce Wastage in Textile Units'

The need for cost reduction by textile units was stressed at a Seminar on Wastage Reduction organised by the Ahmedabad Productivity Council in January. The view was expressed that "with mounting cost of raw materials and accessories, both indigenous and imported, and low productivity, it is a mandate for the cotton textile industry to tighten its belt, and plug all possible holes of flaws, to extract the maximum economy."

The means of productivity were several, but very pragmatic was the reduction of wastage, which played a vital role in boosting the total level of productivity. It was, therefore, essential for the textile industry to know how to reduce all types of wastages.

It was pointed out that standardisation of stores such as bobbins, spindles, shuttles, accessories spares, etc., would reduce a great amount of wastage caused by the varieties of articles required to be stored and used involving great complications. There was a common practice to manufacture various qualities of cloth, varying in counts and construction, and such cloth was thrust upon the processor for processing.

From the productivity point of view, excessive variety in the products and lack of standardisation led to idle time owing to short run or accumulation of goods in one corner. It was, therefore, suggested to reduce the total number of qualities to the minimum, so that all the processes could be carried out with higher efficiency.

discussed the problems with us and who were willing to spare some time for people whose immediate interests were only academic—although in some cases, these contacts are leading to mutually beneficial business contracts.

Follow-up Programme

Perhaps it may be relevant to make a few suggestions so as to make similar courses even more effective in the future. One of the difficulties we experienced was to find adequate time to go through all the material we received; it would be helpful in future if specific time is set apart for reading and library work. In the selection of speakers, it would be desirable if a greater number of aggressive and dynamic managers of the Industries were chosen so that they might bring to the discussions a surer touch and closer knowledge of the problems of the Industry. Another suggestion is to designate individual counsellors for each of the participants who would be able to guide the participant during the programme and help him to obtain whatever information he desired. Such a counsellor should preferably be one who is performing a similar job in Japan as the participant does in his own country. Even

if it is difficult to find one for each participant, it should be possible to have a panel of 5 or 6 counsellors, to each of whom 2 or 3 participants could be allotted. The Instructors could be more in number and a specific role allotted to them in coordinating reports and guiding discussions.

As we return to our homes and native countries and resume the daily routine of our jobs, our minds are full of the many new ideas that have come to us as a result of the programme; and our hearts with the warm memories of our 8-week stay in Japan and the many friendships we have formed. We look forward to welcoming many of the friends from the APO and JPC in our own countries and meeting the fellow participants in conferences and seminars. Perhaps a reunion meeting can be held after 2 or 3 years at which all or even some of the participants of the SBMTC and SIDAC could be invited to review the work done subsequent to the programme and the manner in which the course has helped them. Such a follow-up programme would be extremely useful in renewing old contacts and also to assess the permanent impact of such programmes on the pace of industrialisation in Asian countries.

MANAGEMENT DEVELOPMENT

By Ellis O Keller

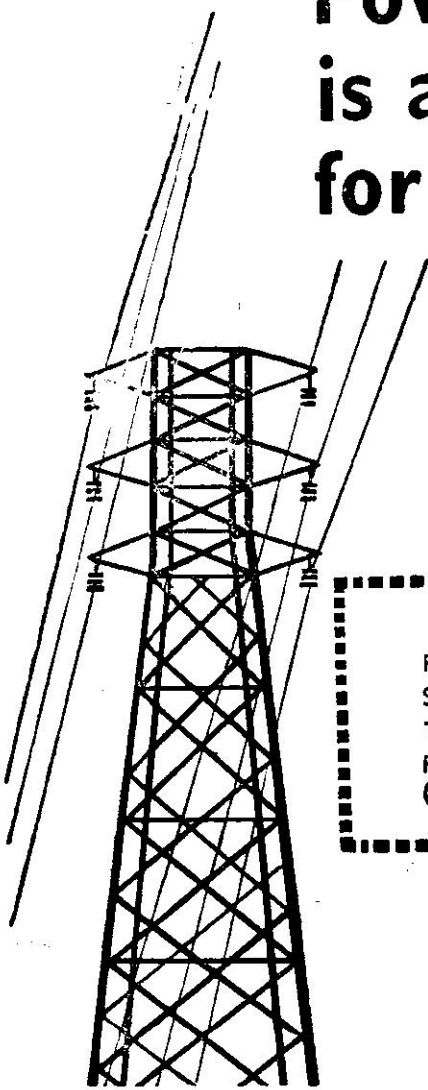
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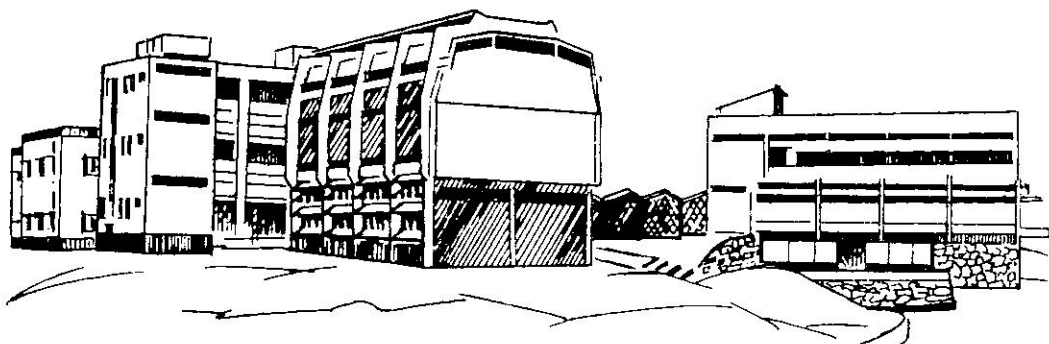
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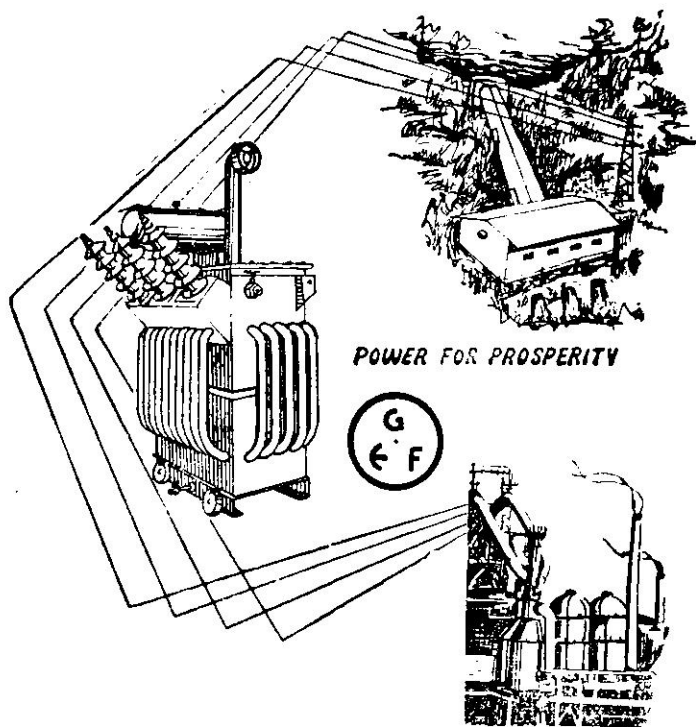
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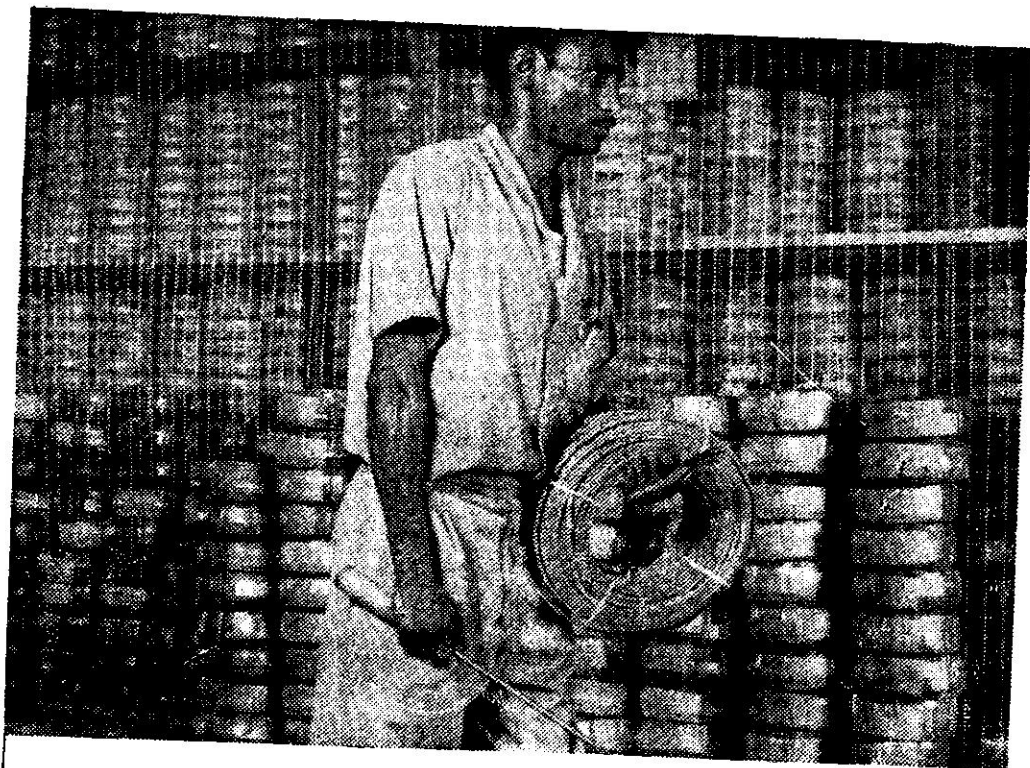
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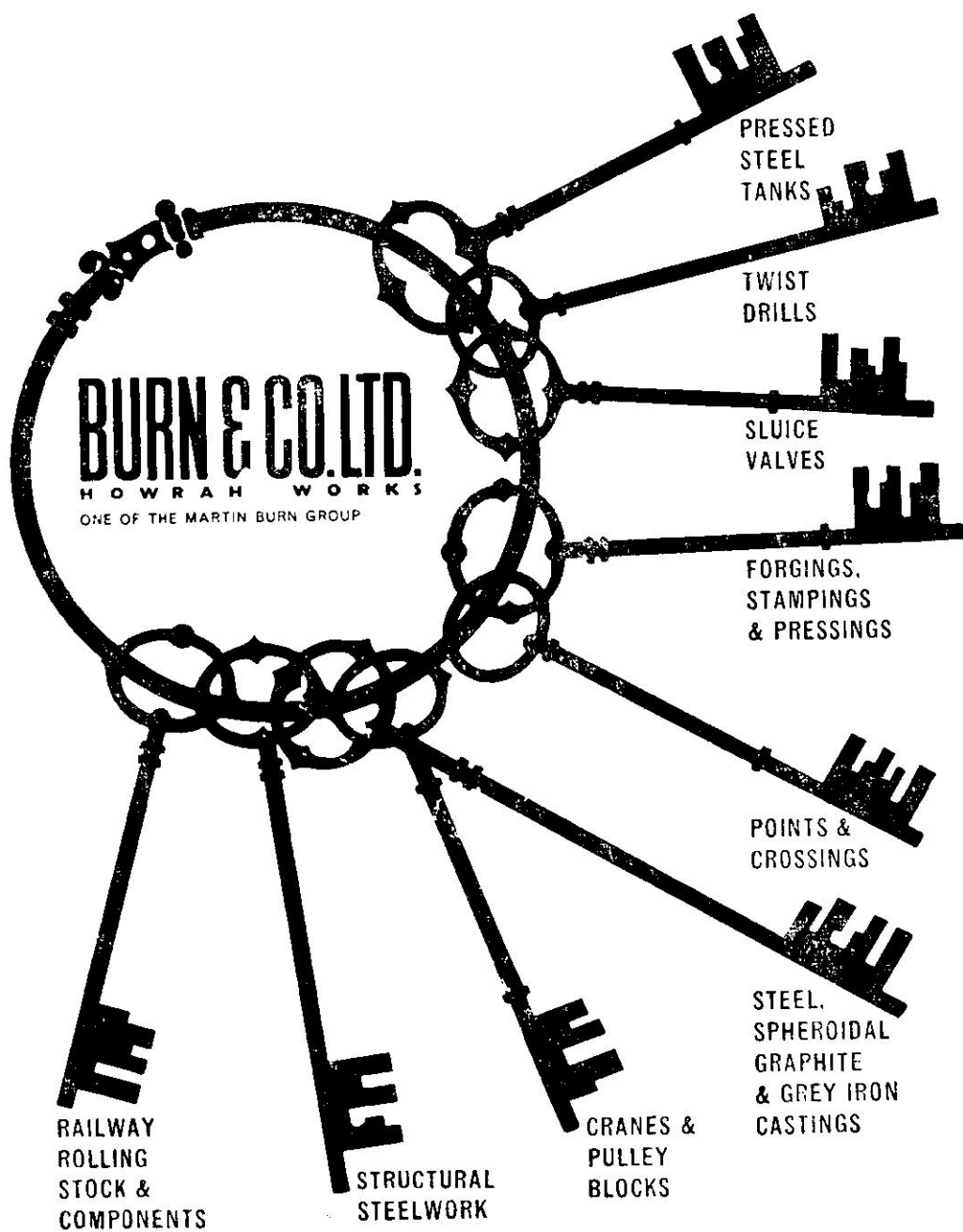
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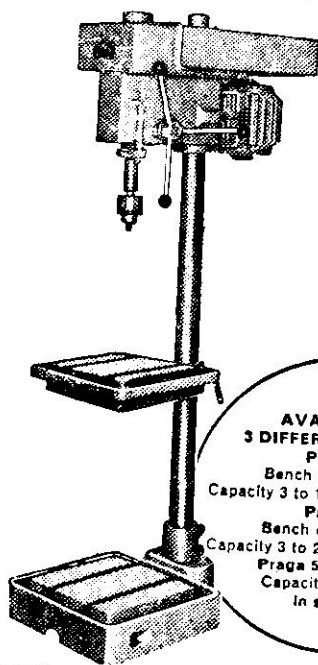
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**MANUFACTURERS OF MACHINE TOOLS,
MACHINE TOOL ACCESSORIES
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**ANOTHER
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TYTON JOINTS[®]

(WITH RUBBER GASKETS)

REPLACE LEAD JOINTS

CUT COSTS - SAVE FOREIGN EXCHANGE



**THE INDIAN IRON
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(ONE OF THE MARTIN BURN GROUP)

Already in use in the U.S.A., the U.K. and elsewhere, Tyton Joints[®] have proved more economical than conventional lead joints for Cast Iron Spun pipes because of several major advantages :

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Made with a single sealing element

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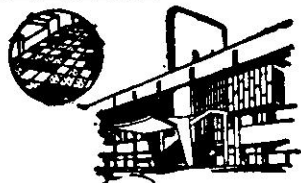
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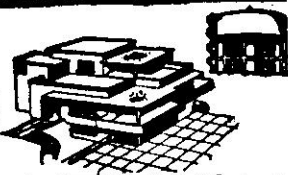
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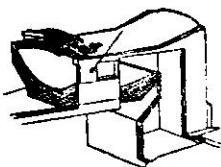
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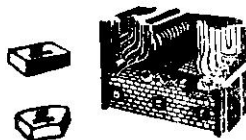
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Castable refractories (in
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FIRECRETE SUPER —
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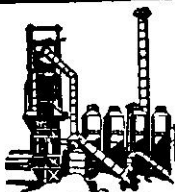
REFRACTORIES

High alumina firebricks
particularly suitable for
the iron and steel, cement,
copper, glass and
similar industries



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A highly refractory cement
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for use in higher tempera-
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