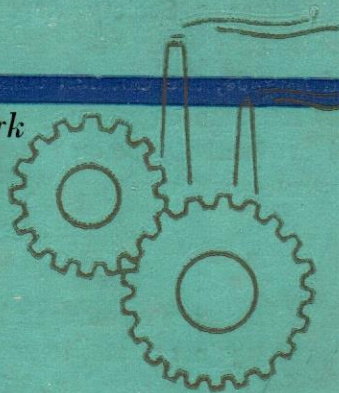


PRODUCTIVITY

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Special Features
Defence & Productivity
Cost & Budgetary Control

NATIONAL PRODUCTIVITY COUNCIL OF INDIA

JOURNAL OF

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. 45 Local Productivity Councils have been established practically all over the country and 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.

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. 2.00 per issue and is available at all NPC offices. Annual subscription (Rs. 12.00 to be sent by cheque in favour of National Productivity Council, New Delhi) is inclusive of postage! Subscription for three years, however, can be paid at the concessional rate of Rs. 32.00.

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

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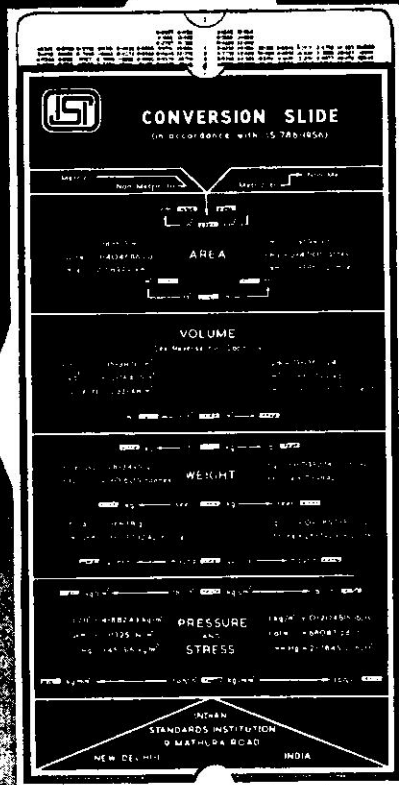
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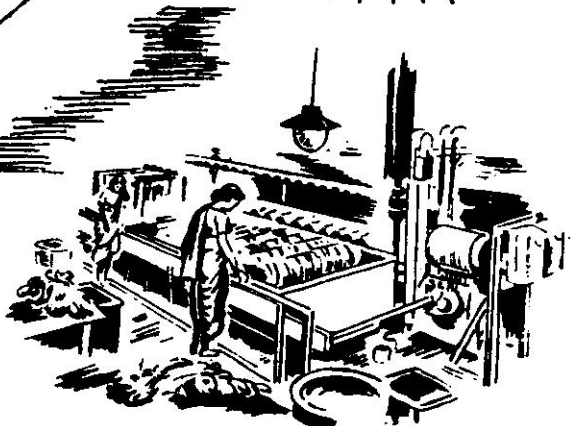
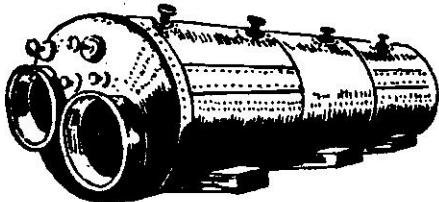
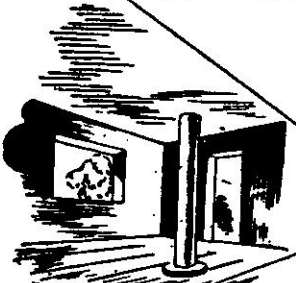
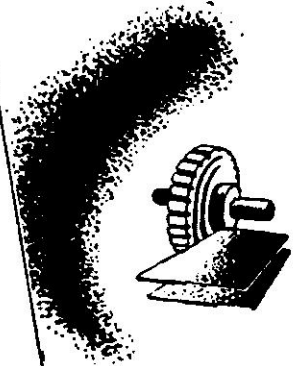
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49 years ... not even a scratch

The rate of industrial accidents in India has increased from about 24 per thousand workers in 1938 to about 44 in 1959. Every year, over 93,000 workers are involved in accidents and 250 lives are lost. Also wasted annually are a million man-hours—enough to produce 170 broad gauge locomotives or 700 coaches for the Indian Railways.

Safety has always been Tata Steel's watchword as efficiency is hardly possible without it. 'No-accident month' as an annual feature, safety exhibitions, training in safety, safety awards, safer working conditions, a continuing campaign under the direction of joint councils to turn safety into a habit...these are some of the means adopted in Jamshedpur to prevent accidents in the Plant.

Safety, however, depends largely on the worker himself because about 75 per cent of industrial accidents are found to be caused by human negligence. This is where men like Jamuna Dube, the oldest employee in Tata Steel, come in. He has worked for 49 years without ever sustaining an injury, not even a scratch.

The importance of safety was one of the first things that Jamshedpur taught Dube when he arrived in the Steel City half-a-century ago... a city where industry is not merely a source of livelihood but a way of life.

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THE STEEL CITY

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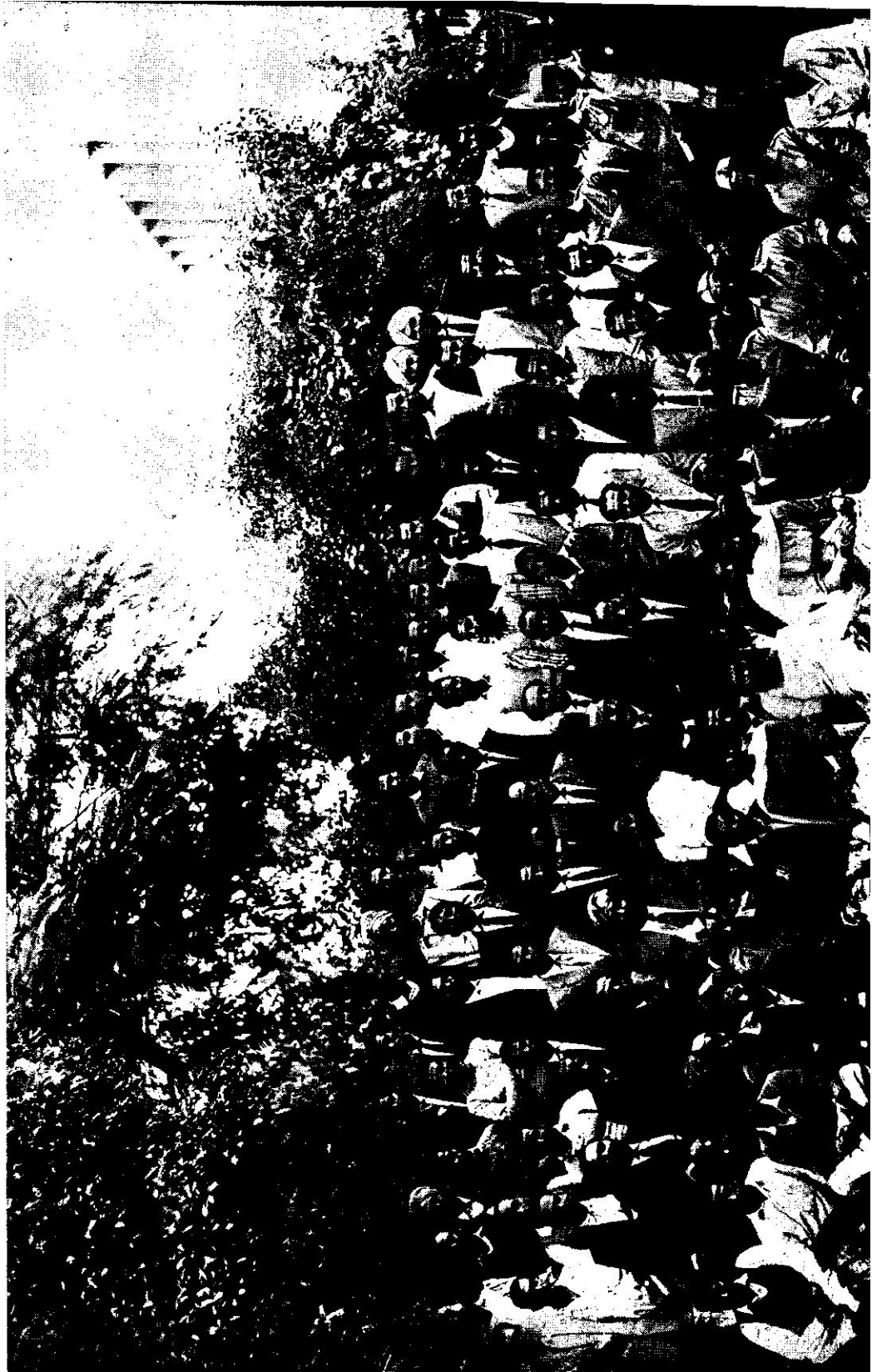
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NPC at HQ with outgoing (HD Shourie) & incoming Executive Director (NK Bhojwani)



Cost and Budgetary Control

THIS ISSUE OF THE PRODUCTIVITY JOURNAL has a special section devoted to the discussion of some of the important aspects of Cost and Budgetary Control* and its place in the complex of productivity techniques. Budgeting as a function of management, as an integral part of production planning and control, the practice of systematic costing, the place and evaluation of research in industry, new product development, cost control through work study, overhead and administrative costs, capital budgeting: all these and many other related subjects have been covered by a number of eminent contributors.

As usual we have also drawn upon foreign experience for the simple reason that managements abroad have built up valuable experience in the field of budgetary control. Its significance has been put in somewhat striking language by an author whose article appears in this Journal: "...there is a secret gold mine in Budgetary Control which a select few have discovered and are mining profitably. A budget is not only a money maker, but the greatest money saver ever discovered. I have seen the stock of one corporation reduced from 170 to less than 90 million dollars, and a larger business done on the smaller stock. I have seen stock turnover in several large corporations not only doubled but quadrupled. I have seen a stock turnover of four times a year increased in a single year to thirteen times...."

All this is possible in India too, with the help of Cost and Budgetary Control. For obvious historical reasons, as Sri PY Thatte of the TISCO has explained in an excellent article printed in this Journal, "There has been a lopsided development of cost and budgetary procedures in India:

*This special issue was originally planned to cover the whole area of Cost and Budgetary Control. Due to the Emergency, a special section had to be created for Productivity and Defence, and a number of other important topics and areas of productivity. It has therefore not been possible to find space for all the writers whom we invited to write on Cost and Budgetary Control and who obliged us by sending their contributions. We shall try to find space for them in subsequent issues. The editor takes this opportunity of recording his thanks for the generous help given in this connection by two specialised institutions upon whose resources the editor has drawn freely: the Institute of Cost and Works Accountants of India, whose President and Secretary took special interest in acquainting the editor with their rich material on the subject, as also putting him in touch with experts in India and abroad (b) the Institute of Cost and Works Accountants London, which put the editor under special obligation by unreserved permission to draw upon their classic works on the subject.

while on the one side we see fully developed systems where highly advanced cost accounting and budgeting techniques are being used, there is the other side in which even the most rudimentary techniques are not in the offing." Of the first type, namely, the concerns which have adopted and practised the techniques of Cost and Budgetary Control in a comprehensive way, the most significant case printed in this Journal is that of the Hindustan Lever whose Chairman Sri PL Tandon, has given us an extremely valuable account of the budgetary practices in his concern. Sri Anil Bannerji of the Batas has dealt fairly deeply with the whole problem of costing and productivity.

The main lesson that emerges from Sri Anil Bannerji's thesis as also of the other expositions in this special issue of the Journal on Cost and Budgetary Control is that this technique like all other productivity techniques is really all inclusive. It is inclusive of planning, task-setting, evaluation, standardisation, work study including work simplification, method study, time measurement, not excluding personnel policy, for it is personnel whose costs and contributions have in the ultimate sense to be evaluated in terms of productivity. Thus this analysis of cost and budgetary control, like the analysis of all other techniques in the preceding special issues*—Incentives, Personnel Management, Measurement of Productivity, Work Study, Quality Control, Materials Handling and Plant Layout—*reveals productivity once again as an integrated phenomenon.*

*It has been decided to continue the system of Special Issues. The next two issues will have special sections devoted entirely to Operations Research, and Productivity and the Worker. As these special issues are now being processed, experts interested in writing on these subjects are requested to send in their contributions at the earliest.

"A good commander is a man of high character. He must know his tools of trade. He must be impartial and calm under stress. He must reward promptly and punish justly. He must be accessible, human, humble and patient. He should listen to advice, make his own decision and carry out with energy."

GENERAL JOSEPH STILLWELL

Defence and Productivity*

AT ITS ANNUAL MEETING IN NOVEMBER LAST, the National Productivity Council called for a re-orientation of the programmes and activities of NPC consistent with the demands of the present emergency. The Council emphasized the importance of the NPC making a special endeavour to raise the level of productivity consciousness which it had helped to build since its inception five years ago.

To the stresses of growth to which our economy was subject before the emergency, have been added more severe stresses. The question posed by unexpected changes in circumstances is: will these new stresses retard the quest for higher productivity? There is a real danger that it may be retarded. While the need for higher production was never greater, the risk that productivity consciousness may recede under the pressures of the emergency is equally great. Its significance may suffer a loss in the conscious calculations of management as a result of their pre-occupations with achieving higher output. Victory is cheap at any cost but can production at any cost bring the day of victory nearer? It is important therefore to guard against the risk of relaxing in our search for the principles and techniques of higher productivity. It is not surprising that the Emergency Production Committee† has laid great stress on the importance of sustaining and enhancing the tempo of productivity in all sectors of the national economy. At a time when additions to our productive equipment cannot be made easily, the principal challenge of the present emergency lies in stretching our resources and making them yield the best that they are capable of.

With a sense of common endeavour to which leaders of labour, management and government have dedicated themselves, the prospect for a more determined productivity drive was never so propitious than it is at present. All concerned need to be reminded so that

*Due to the urgent needs of Defence Mobilisation a number of distinguished thinkers—Dr Lokanathan, Major General BD Kapur, Dr ST Merani, Mrs Mary Cushing Niles, Prof Bruckart, Brigadier Pennathur and a number of others were invited to write special articles on the importance of productivity in the present Emergency. To supplement these writings an article appears on the Organization of Manpower in China by a highly knowledgeable researcher. Another section also has been introduced in this issue of the Journal on Leadership and Productivity which has an important bearing on Defence Mobilisation.

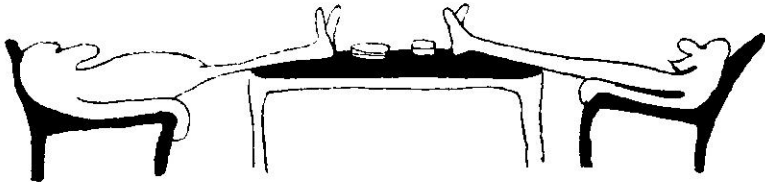
†The Member-Secretary of this Committee has written a special article printed on page 12.

their determination to work with the utmost devotion may yield the result which we all desire. Edison's theory that you can make capital out of disaster can well be tested with reference to the situation in India today. Shall we stand the test? We will stand it if we keep our minds open and do not relegate to a secondary place the application of productivity techniques through better management, better utilisation of the factors of production, elimination of wastage, reduction of cost and other constituents of productivity which it has been the effort of NPC to propagate.

It will be our endeavour now to take our efforts as near as possible to the point of application of productivity techniques. It is possible to do so and the process has commenced with the association of some of our experts with a major public sector organisation in the expansion of its tool room facilities. The NPC will carry out more activities of this nature without losing sight of the basic principle of its activities viz. that the technical know-how which it has to offer should be shared by as many technicians as possible. Therefore even while assisting in the application of productivity techniques at specific points, we will sustain the endeavour to so organise this assistance as to ensure that the benefits accrue to a larger number of units through the participation of their technicians in our programmes. Through such shifts of emphasis it is hoped to aim at quicker and more tangible results. Even so, much will depend on the realisation on the part of managements that there is always scope for higher productivity and a continuing endeavour to locate directions of improvement.



"HAPPY NEW YEAR"



**"It is time for relaxation. The Emergency is going to last.
We shall get organised next year."**

National Emergency & Industrial Mobilisation

Gulzarilal Nanda*

We are faced with a national emergency of an exceptional character. Our country has been invaded by the Chinese. The most precious things are at stake: our freedom and the honour and integrity of India. Our soldiers have fought heroically and laid down their lives for the defence of the country. Most of us have not the opportunity of standing in the fighting line. But everyone of us has a part in the Nation's defence. We can all do a good deal to add to the defence potential of the country. Industry and transport are the vital backbone of defence, and we can work from day to day to strengthen and sustain them at the highest attainable levels of efficiency. We can help the soldiers by maintaining an uninterrupted flow of the things which they need. We also owe a duty to the community, that it may not have to suffer hardship on account of avoidable scarcities.

IT CANNOT BE SAID THAT WE HAVE REACHED the limit of our possibilities, in the matter of production with whatever productive apparatus is available to us. A great deal more can be achieved, in terms of quantity as well as quality. By stepping up production and eliminating waste, costs can be reduced. The increased volume of goods and the increased surpluses which will thus arise can help towards meeting the needs of defence in larger measure and be conducive towards price stability and better management of the national economy.

There should be no idle machines anywhere, and all the machines should run day and night. The highest pitch of efficiency should be achieved. No worker should stay away, or be sent away from his work, except in the most unavoidable circumstances. The workers have the opportunity of serving the Nation by working extra time and on holidays by arrangement. The

additional earnings can be donated for defence. This itself would mean substantial contribution to the efforts for national defence. In a number of places, the workers have given a commendable lead in this respect already.

It is inconceivable that in these times work in any unit in the country is interrupted owing to a strike or a lockout even for a single hour. In a national emergency like this a legal ban on strikes will not be questioned. I feel however that WE HAVE NO NEED TO RESORT TO COMPULSION. We can fully depend on the loyalty and good sense of the workers. They and the employers all over the country have sufficient realisation of the gravity of the situation, and of their own responsibility.

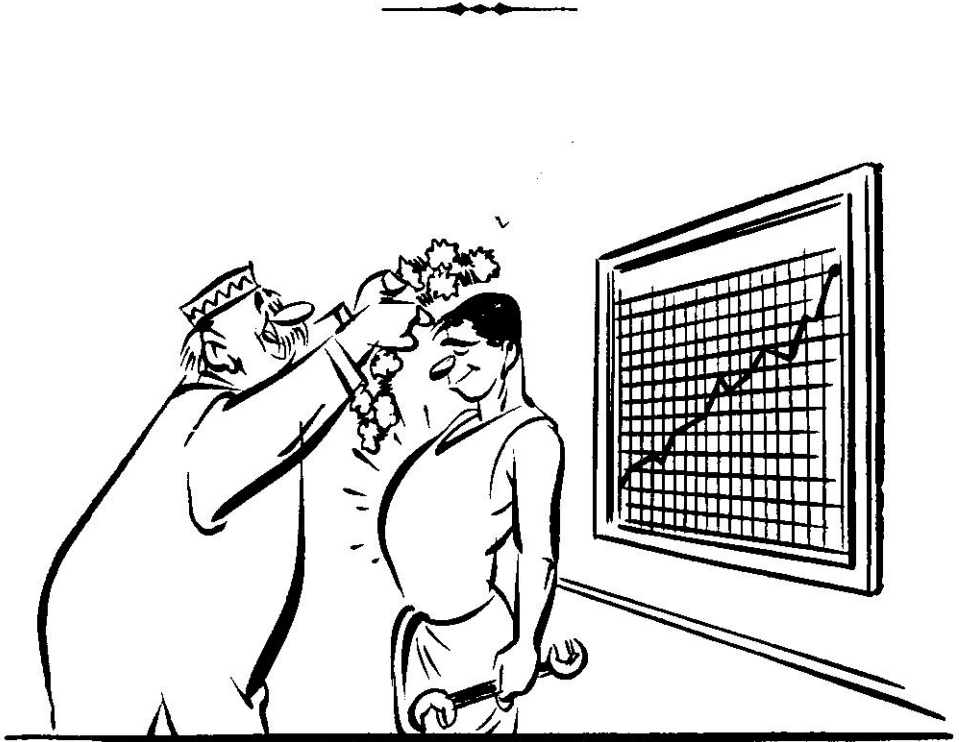
I am not asking the workers to suppress any real grievances which may arise. *Managements should take every possible care and precaution that the workers have a fair deal and there is no room for the generation of discontent among them. But situations may arise, in which they have grounds for*

*Union Minister for Planning, and Labour & Employment, and Deputy Chairman, Planning Commission. The article is based on Sri Nanda's historic broadcast from the AIR on 31 October 1962.

complaint. Very few differences will remain unresolved if there is the spirit and the determination, on both sides, not to let them degenerate into disputes to be settled by outside intervention. When such contingencies arise, however, the procedures for dealing with them should be the quickest possible. Recourse to Courts and Tribunals should become rare. Voluntary arbitration should be the way of settlement, in practically all such disputes. On their part the workers should refrain absolutely from making any trivial, unreasonable or exagger-

ated claims. *Governments in the States or the Centre have their own obligations to streamline their machinery.* I am confident that they will take steps to ensure that no delay occurs in the procedures necessary for settlement.

The aim in all this is the utmost intensification of effort and the maximum utilisation of capacity in order to secure the best possible results in production. Every ounce more of output and every ounce less of material wasted, are of real significance.



A Historic Advance in Productivity

AT A JOINT MEETING OF THE CENTRAL ORGANISATIONS of employers and workers held in New Delhi on November 3, 1962 a resolution was passed which constitutes a historic advance in productivity. It was resolved that: “(i) *all impediments in the way of better and fuller utilisation of men, machinery and materials should be removed.* There should be no idle plant capacity or waste. Managements should exercise the maximum economy in their operations; (ii) to maximise production, establishments should work, wherever possible, extra shifts, extra hours or on Sundays and holidays by mutual agreement. Full cooperation should be extended by all in this respect. All advantages accruing to industry out of the extra effort of the workers should go to the consumer and/or be made available for defence efforts; (iii) absenteeism and turnover should be discouraged and reduced to the minimum. Negligence of duty, careless operation, damage to property and interference with or disturbance to normal work should be denounced by the unions. Similarly any lapse on the part of the management that contravenes the spirit of the defence effort should be condemned and put right forthwith; (iv) technical and skilled personnel in short supply should be switched over to emergent work having a bearing on defence. Simultaneously steps should be taken to increase the supply of technical and skilled personnel through apprenticeship and other training programmes; (v) in the production drive the well-being and health of the working class should not be ignored.

To give concrete shape to their determination that “no effort shall be spared to achieve maximum production” an Industrial Truce was declared in the following unequivocal words: (i) *Under no circumstances shall there be any interruption in or slowing down of production of goods and services.* (ii) In respect of their economic interests both workers and employers will exercise voluntary restraint and accept the utmost sacrifice, in an equitable manner, in the interest of the nation and its defence efforts. (iii) There should be maximum recourse to voluntary arbitration and adequate arrangements should be made for the purpose. If necessity for a reference to adjudication arises, the processes connected with it should be completed with the utmost promptness.... Dismissals and discharges of workmen should be avoided as far as possible.... The Labour administration at the Centre and States should be streamlined so that grievances and disputes are settled promptly and cordial industrial relations are maintained”●

Emergency and the Productivity Movement

PS Lokanathan

For quite a number of reasons, we in the National Productivity Council begin a new and what appears to be the most promising chapter in the life of NPC. The National Emergency really constitutes a challenge for those of us in the productivity movement who have claimed a substantial mass of intangible gains, in terms of productivity consciousness, knowledge of productivity techniques and the like, as a result of the work that we have done since the beginning of 1958; and never was the need greater for productivity in the purest sense of the word, namely, the producing of a larger and larger quantum of goods of acceptable quality from a smaller and smaller quantum of resources. Defence will now make a sizeable draft, both direct and indirect, on the resources of the community for consumer goods, for supplies of all kinds, for machines, for transport facilities, and the millions of things that keep a modern army efficient, comfortable and mobile. We who are left behind the front owe this to the boys who risk their lives for us that they have a reasonable chance of accomplishing the objective that we have set for them; in short, there is an urgent call for the fullest and most productive mobilisation of social resources.

I HAVE CALLED IT A NEW CHAPTER IN THE history of the productivity movement because for the last so many years we have been speaking of the hurdles to productivity and the means by which we could overcome these hurdles. There was the resistance of the working class to modernization and rationalisation, not to speak of automation; and a compromise was arrived at, known as 'rationalisation without tears'—a process of gradualism. Managers of industry tried to argue that this certainly was not productivity but we had no answer to the problems which they posed. We argued with them for the modernisation of techniques, equipments and procedures, but we were at the same time conscious, in all conscience, that in a situation of much less than full employment and widespread underemployment, low wages and the struggle for survival among the mass of the people, rationalisation and modernisation would create social problems of an

enormous character, offsetting the economic gains of productivity. Now rationalisation is no longer a problem. Workers are prepared to accept rationalisation and everything that goes along with it, for they know that there is going to be larger and fuller employment and the community has now the will to pay them, what after all is a fair wage level.

No longer is sharing the gains of productivity a problem, for the gains all belong to the community; and managers and workers alike are prepared to sacrifice the gains of greater productivity for the national cause. It goes, they know, into the national account. During the last many years we tried to build up quite a number of technically elaborate formulae for sharing the gains of productivity. Of course we were not successful, even in a technical sense, primarily because at the back of our minds, was the consciousness of lack of fundamental agreement regarding the sharing of gains.



Dr PS Lokanathan
Founder—Chairman of NPC 1958—63





Top left: Sri KC Reddy, Union Minister for Commerce and Industry and Dr Lokanathan, Chairman NPC, inaugurating the Top Management Seminar at Vigyan Bhavan, New Delhi, on November 5, 1962



Sri
NK Bhojwani
now
Executive
Director

Top right: Sri Nityanand Kanungo, President NPC with former Executive Director and Secretary NPC.

4



Officers
of NFC
(HQ) with
new
Executive
Director

Now the whole situation has undergone a sea change. Everyone is anxious to do his best without insisting on a *quid pro quo* or his personal or sectional rights and privileges. It is essential in this context that industrial managements should take this opportunity of setting their house in order and of carrying their workers along with themselves as part of a long-term programme. The Emergency has really made the job of industrial management easier than it ever was. No longer do managers and workers consider themselves as two separate species of humanity, each thinking that the other needs improvement, the result being only internal strife and little of productivity in the bargain. The National Emergency has at least for a while knocked out the basis for this conflict because both the managers and workers are now working for a cause beyond and above themselves; but the little self of man is bound to come up and if we want this productivity atmosphere to last, we must build on solid foundations. Success will depend upon the way in which management uses the unique opportunity produced by the present emergency. Workers should be convinced that they alone don't have to make the sacrifice; managements should even do more. Sacrifices should not be on one side.

The cultivation of good human relations for which the climate is favourable can only be on the basis of the principle of all making appropriate sacrifices, the management in being prepared to let their share of the profits to diminish in favour of the community at large. Secondly, the Emergency should not be utilized by either party to

consolidate their relative position at the expense of the other. Once these two points are recognised and accepted, it should not be difficult to overcome resistances to change, to improvement, to rationalisation of every kind, to the thousands of adjustments that are constantly needed in industry so that it delivers the goods of the right quality and in quantities that the market will take. Now marketing itself has ceased to be a problem because defence and civilian consumers and the priority needs of the Third Plan will take all that we can produce. But in that context, maximisation of productivity all along and up and down the line constitutes almost a national obligation.

And the atmosphere is favourable. Because of the paramountcy of national demands on resources, productivity is likely to get deeper into the consciousness of the community, if we only will use the opportunity. It is really intriguing to reflect how workers themselves have begun to demand what amounts to work study. They want simplification of procedures, straightening up of the lines of action, of operative systems and the like. They insist on the avoidance of waste of all kinds. They are themselves anxious to economise, for a consciousness has come up that the more we economise, whether in terms of money or in terms of materials, the larger the output we produce in a given unit of time, harder we work, the greater our cooperation in any kind of job, we are somehow or the other contributing to the success of the national cause. Productivity has really come into its own.

Trouble is opportunity in work-clothes

Role of Work Study in the National Emergency

Maj. Gen. BD Kapur

The author, who is Chief Controller of Research and Development in the Ministry of Defence, was specially invited to write on Defence and Productivity for this special issue in the context of Defence Mobilisation. He has given below a good account of how various productivity techniques—including Work Study—have actually been utilised in the training of the armed forces during and since World War II.

WORK STUDY AND OPERATIONAL RESEARCH had their beginning in World War II. With a view to maximising output with available resources, scientific studies were undertaken to reconsider procedures, methods, plant layouts, utilisation of labour and any other matter which required the decision of the management. Role of work study in an emergency therefore assumes greater importance.

As a result of the growth of work study concept in Europe, a Federation of Work Study has been formed with eleven countries as its members. The Congress meets annually to exchange views on various aspects of studies carried out. In India, work study is still an innovation but the few organizations, both government and private, who have instituted the concept of work study, have certainly begun to reap the benefits of it. For example, both in the Imperial Chemical Industries (India) and in Burmah Shell Organization, the top management has directly under its control a work study cell. There is no project, too small or too large, which is not reviewed by the work study cell before it is put up to the top management.

Consequently, with efficiency as the aim large savings are effected in organizations and manpower, and in the layout of buildings.

In defence we have introduced the doctrine of work study by establishing a Work Study Institute. During the course of the year at this Institute 140 officers have qualified at various courses. The Institute was established in February 1962. Whilst inculcation of the work study techniques is comparatively simple, their application is dependent upon the enthusiasm of the worker and of the top management. Until a few successful studies are carried out, work study will remain a new subject in defence. But it is encouraging to note that interest is shown by the Army, Navy, Air Force and the Defence Production Organization and some studies have already been initiated and we hope that this will encourage further studies to be undertaken.

There could not be a better opportunity to give a fillip to work study in defence than in the present national emergency. Resources are invariably limited and they are very much limited in war. Optimum utili-

zation of resources and maximization of output, whether in training, administrative organizations or in buildings or constructions required to be put up in the shortest time with minimum of labour and minimum of cost, work study can come to the aid of the Services. There is not an organization whether at the Ministry level, Service Headquarters level or lower formation level, which does not need to be workstudied to

improve its efficiency. The philosophy of work study is: "There is always better way" and if this philosophy is acceptable, particularly in the present context of conditions in the country, tremendous prunings and re-organization of existing systems and evaluation of new projects can be carried out. We only hope that the present conditions will compel those in top authority to take advantage of this scientific technique.



**The best soldier is not soldierly,
 The best fighter is not ferocious,
 The best conqueror does not take part in war,
 The best employer of men keeps himself below them,
 This is virtue of not contending,
 This is ability of using men.
 The great rulers, the people do not notice their existence,
 The lesser ones, they attach to and praise them,
 The still lesser ones, they fear them,
 The still lesser ones, they despise them.**

Intensive Utilization of Resources

ST Merani*

The author had developed this thesis quite a few years back†. The theory—rather the plan presented below—of intensive utilisation of resources has acquired a certain urgency in view of the needs of Defence Mobilisation. In fact even the language appears surprisingly and peculiarly oriented for the National Emergency: "...there must be no idle plant or machine capacity anywhere. All equipment must be put to proper use. No bench, drill or lathe must be used except where it is needed most and where it is giving the maximum results. *No bottleneck must hold up work anywhere as this might in turn lead to something remaining idle somewhere else.* there must be the most intensive and effective utilization of resources continuously in all directions and at all levels. *Someone must know what this really means, what is the best way of doing it and also to ensure that this is done*"

COUNTRIES WITH SURPLUS MANPOWER RESOURCES (these are mostly economically and industrially less advanced countries) have many pressing needs. The size of their needs is also enormous. The two most urgent needs are increased employment and increased production. These are parts of the same phenomenon and could be attacked simultaneously. It is vital that these two increases must take place at an ever-growing rate as otherwise the results of the attack on the problem of unemployment and underemployment on the one hand and on underproduction and underconsumption on the other will not be visible enough and might even be negligible with the growth of population. There are many known ways of dealing with these problems. It is, however, intended to single out only two main possible ways of dealing with them. The one is to increase resources, particularly capital resources, by raising the maximum that could be gathered within the country and by obtaining more and more from out-

side from friendly countries and institutions. Resources must be increased not only in size and extent but the increases must be continuous and rapid. What we are seeking is a massive impact upon two of the most urgent needs. The second is to ensure that the existing resources and those that are added are put to the most intensive use to give the maximum results as quickly as possible. It is also essential that the results should grow in size, variety and depth. They should reach all vital sectors of population, industry, agriculture, communications and the various phases of economic life.

In the present National Emergency, we must see by all possible means that everything is put to the most intensive use. If we work a machine for 8 hours who can call this intensive utilisation of that equipment? Has anyone an idea of the extent to which resources might be lying idle this way for a large part of the working year? In that case we are utilizing only one-third capacity of the equipment we have. Is this not serious enough to suggest a critical look at facts?

Equipment is only an illustration. There are many other resources which could be

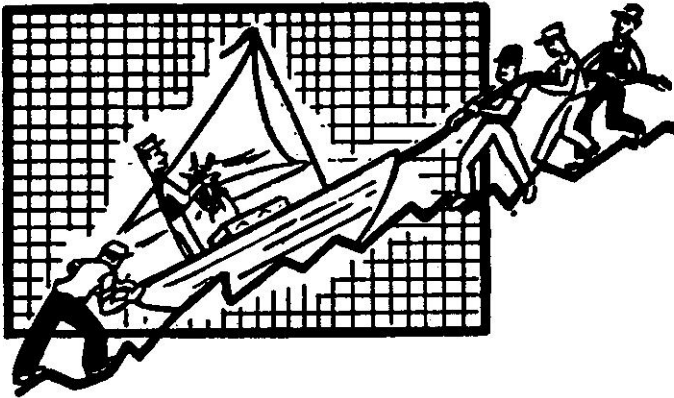
*A distinguished civil servant, Dr Merani was Chairman of the Governing Body of ILO in 1961-62. He is at present working as Member-Secretary of the Emergency Production Committee.

†AICC, *Economic Review*, September 15, 1959

put to fuller and more intensive use. Once we begin to take a look we will find areas which need to be remedied, the movement will grow and we will get more employment opportunities from our resources. Every additional man and woman in employment will mean greater economic activity, greater production, greater incentive to achieve more and more and within increasingly shorter time. It is the beginning that has to be made. We might wear out our equipment more quickly this way. But does that matter? We will have time to replace. We will then get even better equipment. By then we will have progressed in building larger resources. The tempo of development will have increased. It will be a new life.

We need a three-shift system for all our resources. This is done during a war. The

needs of peace are in fact greater. That goes for industry but what of agriculture? In the case of agriculture we must intensely look to 'land' to provide more employment and also more food. We need more handicrafts, small scale industries, cooperatives, labour-intensive methods of carrying out rural tasks. We must concentrate on methods of intensive utilisation of land resources. It is most important that we cultivate each piece of land not as a field but as a garden. We will then get more out of our land. We will then need more working hours (attack on underemployment) to look after the same piece of land. A massive, sustained and enlightened programme of intensive utilization of resources based on our strength of manpower, land and capital will give us the employment and the food we need.



Everybody tries to help when they all have the feeling that a group is going places together.

Management and the National Emergency

Mary Cushing Niles*

As a private American citizen I am concerned about the National Emergency brought about by the Chinese aggression. The association with India of my husband and myself is so deep that we consider it our second country. When therefore the Editor of this Journal asked me to write on this National Emergency I readily fell in with the idea. Like most Americans, we are deeply concerned with the cause of freedom, and we would like to be of help to India in the new struggle for freedom forced upon her.

I SPEAK AS A MANAGEMENT CONSULTANT because that is my line of specialisation and that is the mission for which I have come to India for the third time. There is, of course, a substantial problem in that more resources will have to be devoted to the immediate demands of the defence forces and the supporting industries. These will use up foreign exchange and other services which would otherwise have gone into national development. There will be shortages both in material and in trained personnel. People in charge of affairs, particularly in industry, will have to improvise methods by which to turn out necessary goods and services out of a smaller volume of resources. *Productivity will be of the essence.*

In spite of difficulties, management in some respects will find its job easier. Because of the National Emergency, people will show new attitudes of a more helpful and

cooperative character than before. They will be willing to learn new skills and adapt to changes in a shorter time than under normal circumstances.

Further, consequent on a large scale programme of defence mobilisation there will be a much greater mobility in all ranks of labour. Management will have therefore *a unique opportunity to try to fit the right type of men to the right jobs.* Employers will be able to take better advantage of the training and skills of well-prepared persons.

With high mobility of labour, more training will be necessary. Through job engineering, jobs may be broken down into component tasks so that a simple cluster of duties may be assigned to a new individual. Thus he can learn quickly and become fully productive. When he has achieved proficiency, more tasks may be added to his job

* Mrs Niles is at present on her third tour in India, speaking to Productivity Councils, management institutes, and university groups in 16 cities. Active in the American and international management movements, she represented the International Scientific Management Committee in India in 1953-54 and served as management expert to the Government of India's Committee to establish a national management association and local institutes. She has held various management positions in the US Government, done management consulting in industry, and engaged in teaching, organising and writing. Her book, *The Essence of Management*, was published in and for India, also in US & Japan, where her *Middle Management* has been published. She is co-author with her husband of 'The Office Supervisor'.

so that he will sustain interest and perform more assignments responsibly. The better people are thus readied for promotion to jobs of a higher level of skill and knowledge. *The average person will show a greater desire under emergency conditions to be useful.* He will however need to know how his contribution ties in with the emergency. In this respect management has a special responsibility to make information available to the worker on what he is to do, how, where, when and in how long a time, how well, and with whom, including whom to consult with or call on when difficulties arise in the work. Unless the worker does know these things, his responsibility is not defined and he cannot fully accept it nor can he work effectively with others. If management cannot make all such information available, they should arrange to provide as much as they can. *Management has a newly reinforced duty to cut out useless and irrelevant work which somehow accumulates under ordinary conditions.* Useless work is very frustrating to the worker and impairs morale.

Objectives should be reviewed and priorities assigned. Low priority activities should be eliminated.

Desired results should be defined as far as possible in measurable items and with target dates. In so doing, the critical points in the work should be determined. These critical points should then be carefully observed so that any failure to achieve results in quality, quantity, or time will be quickly noted and adjustment made. This practice is true control, which maintains a balance in activities as they move toward the goal. Control is not a routine checking of all details but rather observation of key points.

The Emergency exercises the talent of management, at all levels, to innovate and improvise. The available resources in terms of men and material, the specifications of defence requirements, as new situations arise, go on changing, while goods and services have to be delivered on schedule. Constant innovation must, therefore, go on within the organisation in order to meet standards in quantity, quality and time.

The times will bring many new problems but also intensive growth in managers and in men. A period of dedication brings out goodwill and a willingness to do one's part. Thus, *with good management, quite ordinary people can do an extraordinary job.* JAI HIND



Seek the causes. Consider these three—(1) engineering specifications, (2) method of manufacture, (3) employee attitude.

Productivity and the National Emergency

RF Bruckart*

"... so thou wouldst avoid the hell-fires to which the complacent are doomed? Then to action commit thyself, for therein dost thy salvation lie."
—Ole Deeze Philosophies (I)

WHEN ANOTHER ARTICLE ON "PRODUCTIVITY" is added to the thousands that have gone before, it must be incumbent on the writer to say something new, or, lacking innovation, to explain to the reader why the well-worn stereotypes are again being paraded before him. *The urgent need for increasing productivity in light of the national emergency seems compelling enough, however, to justify another run-down on the nature of the concept.*

Of course, whether in times of peace or in war, all managers deliberately or intuitively want "productivity", i.e. high productivity in their operations, and the two approaches to attaining this goal are common.

The first approach assumes that nothing is free on this earth, and commits itself to an intellectual attack on productivity problems. Through their planning endeavours, industrial leaders using this approach filter out logical programmes for attaining productivity by hard-hitting, logically conceived plans of action. Of course, this is hard work!

The second approach employs a more emotional attitude, and relies on dreams of finding a magic formula: an elixir of industrial life. These managers limit themselves to searching for exact solutions to specific

problems. They hope to find the easy way out. They limit their efforts for improving productivity to a tinkering with existing methods, which, having been passed from one generation to another, have become sacrosanct and inviolate. Unfortunately this enchanting pastime leads to the pursuit of useless management "gadgets" that at best can yield symbolic advances in management proficiency. Perhaps, one might speculate, if they understood the nature of productivity a little better....

So let us consider once again the characteristics of this thing called "productivity". In the first place, its characteristics are most easily narrated in terms of negatives. Productivity is not a tangible thing, and is *not in large supply* throughout the world. In fact, the need for constantly raising productivity levels is a major preoccupation even in the most highly advanced industrial countries. In short, productivity is not easy to come by.

True, when a country faces critical times, and needs food or defensive weapons, there are friendly countries willing to provide them. But there is no Public Law or other legislative device by which tons, ship-loads, or even single units of "productivity" may be imported in times of crisis. No surpluses of productivity are available anywhere in the world for export.

* US AID expert attached to NPC.

Consider the details of this difficulty :

1. Productivity cannot be imported with "foreign experts" in the manner that they bring in personal baggage. Nor can these experts leave productivity behind them when they depart.
2. *Productivity has no nationality.* There is no "American productivity", "British productivity", or "Indian productivity". Just as good management is good management—so productivity is productivity. Nor is it related to so-called "Indian conditions", as technically there is no such thing as Indian conditions—only efficient conditions and inefficient conditions.
3. Productivity has no ideology. There is no "Socialist productivity", "Capitalist productivity", or any other ideological designation that has any meaning in defining the nature of productivity. *Productivity is non-aligned politically.*
4. Productivity does not react to the effect of words. It requires more than the tune of the snake-charmer's *bean* to woo the benefits of productivity. It is not invoked by promises, nor does it bow down to threats, no matter how eminent the promiser or how frightening the threatener.
5. Productivity, in summary, cannot be bought, loaned, lend-leased, inherited, gifted, stolen, or otherwise transferred in ownership. Nor can it be picked up in one place and put down in another.
6. Productivity is not reliable. It is fickle, and therefore feminine in nature—requiring its possessor to bestow undying attention to it, and at the slightest whimsey or sign of neglect may desert him who would possess it.
7. Productivity is not simply new machinery or better management techniques or clever administrative methods. Productivity, in fact, never has derived solely from such sources. If there is inertia or sluggishness in the operation of a company, revised administrative procedures and a manual of

standard practices will not by themselves overcome it.

8. Productivity is not necessarily the product of a comprehensive knowledge of good management practices. Observe: some of the most knowledgeable managers revel in their understanding of management theory and have capacities for unending quotation of what the "experts" say—yet operate the most unproductive shops and mills to be found.

What, then, is productivity? What adjustments are necessary in times of emergency in the attitude towards productivity, and how does the manager react to them? When these questions are explored, embarrassing deficiencies are sometimes revealed, for the fact of a changing situation may put such demands on the skills and knowledge of old-line managers that they are unable to meet the new requirements. The situation may require a replacement cadre of young executives and managers with new skills and more progressive attitudes.

The reason for this is simple: productivity is achieved from a management that is dynamic: a management that is devoted to bringing about change and improvement. So, if dynamic management is so important, how can a manager determine whether his operations possess the necessary qualities? Simple! Let him consider, for example: Is he sparking a strong force of innovation and improvement in his organization? Is he infusing new ideas and new products into his operations? The company whose executive must answer "no" to these questions is not advancing, and the company is probably not very productive.

Consider further: what about methods? Are the methods used now the same as those used several years ago, or even earlier? If there is no concentrated programme for constantly improving methods, productivity is surely falling off as time passes—not only relatively but absolutely, as well.

Furthermore: what attention is being paid to costs? Is there a full-time programme

underway to minimize costs through reduced waste and more efficient operation? If not, the level of productivity is surely drifting in the wrong direction. Are costs being made available for day-to-day managerial guidance? Detailed records of historical costs are interesting but of limited usefulness to the manager who wants to plan now for the future.

Productivity is stimulated by active programmes that spur on a company to avoid the dangers of stagnation. In productive shops management is constantly building on the accomplishments of the past to attain a new frontier of efficiency. Obviously the productivity-minded executive must be an action-getter! Such executives are familiar with the broad trends in their industry, and are aware that unless their companies continually advance to higher levels of effectiveness, decadence is sure to set in.

Productive companies have definite programmes for the development of young men of executive and managerial potential. Training programmes are designed to overcome the complacency that derives from self-satisfaction and smugness about existing operations. Highly trained personnel are regularly advanced by such companies into positions of responsibility as replacements for those whose work habits belong to an earlier generation of management.

A final test: is authority excessively con-

centrated in the highest levels? If so, a company attracts and keeps on its rolls only passive and dependent people, who have *that dull, grey look of mediocrity*. Such a company will be full of yes-men who do and say only what they think the boss will like. The man of ambition, vitality and originality is unlikely to be found there—and high productivity, in the best sense, is also sure to be a stranger to this organization.

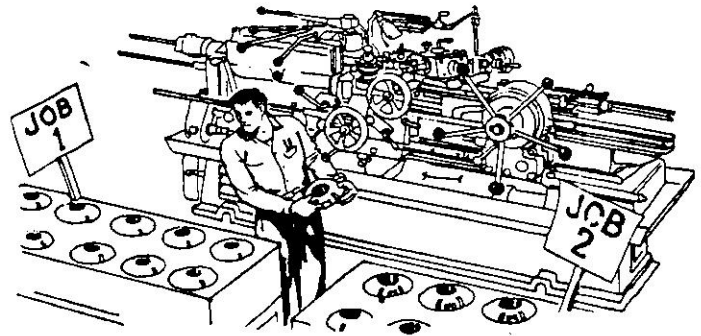
So the positive characteristics of productivity add up to a simple conclusion: productivity is the result of a dynamic management-point-of-view—it exists where there is a definite attitude of progressiveness.

Now, what is the effect of a national emergency on operations? One effect is common: severe shortages are combined with crash demands for increased output. Management under these circumstances cannot afford to be passive and care-free about its effectiveness, and no "gimmicks" or easy solutions will be found to solve the serious problems that pile up on the executive's desk. Only *results* are acceptable—excuses are not enough. Obviously, only dynamic day-to-day guidance of company affairs will produce these results.

... so, is it reasonable to assume that *the national crisis will stimulate a drive for increased dynamism*—and for the urgently needed increases in productivity, dynamism creates?

The Clean
Vs
The Confused

Calculate
the Cost



Productivity for Defence

Brigadier K Pennathur*

The defence of our nation against external aggression depends upon a multitude of factors: the morale of the soldiers, the will of the citizens to preserve territorial integrity, the contribution of the scientists, the sagacity of military leadership, the wisdom of the political leaders and so on. But the two very important considerations are the economic resources and industrial potential of the country.

PEOPLE TEND TO ASSOCIATE THE TERM Productivity with industrial production only. It would, therefore, be appropriate to recapitulate the significance of the term Productivity. Productivity, in simple terms, is the function of achieving more and more of everything, for more and more people with less and less utilisation of resources. Thus Productivity is as much applicable to research, development, administration and budgeting as it is applicable to manufacturing activities.

In the overall defence picture, four primary considerations have to be examined for higher Productivity: Strategy, Technology, Industry and Economy. Strategies are ways of using resources for the achievement of national objectives. Technology indicates possible strategies that may be employed. Industry transforms technological indications to practical supply of the 'where withal' for the implementation of the strategy. The economic consideration lies either in the choice of strategy, equipment and field of industrial production to achieve the highest possible efficiency, which predicates the maximisation of the achievement with given resources, or in having a pre-determined objective and minimising the cost of this achievement. Whichever be the choice, Productivity plays a vital role.

* Director (Defence Ministry) Work Study Institute at Mussoorie.

In the orientation of the national policy towards defence, the primary economic factors would be: the quantum of national resources available now and the potential for the future; the proportion of these resources that should be made available for national defence; and, most important of all, the efficiency with which the allocated resources are utilised for the national defence. Considerations of Productivity affect the first two factors at the highest level of national planning and budgeting. The impact of Productivity on the third factor, i.e., the efficiency with which the allocated resources are utilised for defence ends, has necessarily to be felt by the nation, as a whole.

In the context of national security, no one can afford to ignore the urgent call for higher Productivity. At the very highest level, the problem is the selection of the most effective strategy. At the next level, it is the choice of the right types of aircraft, equipment and weapons on the basis of cost-performance basis. At the third level, it is *the eternal quest for cutting down costs* by employing better methods, using cheaper but efficient substitutes in materials, maximising machinery utilisation, improving materials handling, increasing human effectiveness at work and optimum utilisation of space and buildings. *This call for higher Productivity is one which can be ignored only at the peril of jeopardising our national integrity.*

Defence Mobilisation and Productivity

PR Brahmananda

In a broadcast from the All India Radio, the author, a distinguished economist of the University of Bombay, put forward the thesis that it was practicable to double output through a massive mobilisation of existing resources in terms of men, materials and industrial capacity, appropriately supplemented by a more generous supply of foreign aid, on which we can now reasonably count. The author rightly urges the capitalisation of the emotional upsurge consequent on the shock of sudden invasion; and it is also not unreasonable to count as resources "the tradition, philosophy and culture and a civilisation of more than 2000 years... brought to bear against the notion that might is right... Ultimately, the way in which India answers mainland China will determine the fate of humanity's best values. It is a conflict between tolerance and totalitarianism, between hundred flowers and one dogma. It is this challenge which India's economic process has taken up. Every unit of labour, every factory, every farm has a role to play in the above. Truth, compassion and humanity are the abiding wages and profits of the struggle that is on." But the means to combat Chinese aggression is Productivity, greater and still greater Productivity, for the Battle is essentially between the Total Social Productivities of the two systems.

DURING THE LAST DECADE OR SO, THE WORLD of economists and philosophers has been closely watching the economies of both India and China. For quite some time, the world was deluded that China had actually made a big leap and had refuted all reasonable economic hypotheses concerning economic growth. It was in that period that some people tended to discount partly India's achievements. However, it is now realised that a good deal of China's progress, particularly in the agricultural sphere was statistical. As admitted even by China's planners, the "big leap" in retrospect appears to have led to a major setback.

The events of the last few months, so momentous in India's recent economic history, have to be viewed against the historical perspective. There can be no doubt that the invasion of India by mainland China and the courageous and historic decision taken by the Government of India, having the sanction of the unanimous opinion of the people of the country that the menace on the northern frontiers should be

repelled with all the will and material at the disposal of India, have led to far-reaching changes in our economic process.

During the last two months, the Government has initiated steps to prepare the country's economy for massive mobilisation. Just as in the political and social spheres, a powerful wave of determination and unity is sweeping the economic world. For some time to come, the long-term controversies bearing on the type of economic pattern that should underline the country's economic policy will be at rest.

If we abstract from changes associated with balance of payments, maximum mobilisation implies firstly an expansion in the size of the labour force; secondly, an acceleration in the rate of production of defence-oriented industries as also an acceleration in the rate of the capacity and production in industries catering to essential consumers' goods needed by defence forces and ancillary personnel and also by civilian population; thirdly, a curtailment in the rate of production of unessential types of consumers' goods,

as also in the rate of growth of capacity in this sector; fourthly, under certain conditions depending upon the magnitude of mobilisation it may become necessary even to curtail the relatively less essential items of consumption and even of investment.

Thus massive mobilisation implies structural readjustments in the pattern of priorities. This in its turn leads to alterations in the pattern of flow in scarce resources, and an acceleration in the rate of production and capacity in the quantity of scarce resources. Under conditions of maximum mobilization, the connotation attached to scarcity undergoes partly a change. Though the country as a whole must gear itself to the acceleration of the rate of essential development through larger production, minimization of breakdowns and stoppages, and larger and longer periods of work on the part of the general population, some extent of curtailment in per capita consumption becomes necessary. Every form of civilian consumption directly or indirectly makes an impact on scarce resources. It is possible to bring about a reduction in potential levels of civilian consumption either through the mechanism of created money and rise in prices or through voluntary or planned cuts in wage and salary levels, and in profits. To the extent that foreign aid becomes available in larger quantities and fills the nation's potential machinery and wage-goods gaps, a given quantum of domestic effort will yield larger results. Anyway, maximum mobilisation would imply a pressure on men and material. The mechanism of financial adjustments conceals the real transfers.

The impact of massive mobilisation that is in process will be felt in almost all economic activities. The first immediate impact will be the draft on the manpower of the country. The size of the military force will have expanded. During the Second World War, within a short span of about a year, the strength of the Indian army increased by more than 100 per cent. Over the period of war, the size of the military expanded by nearly two million. Under the current Indian conditions and the tremendous reserve of patriotism that the youth of the

country possesses, manpower requirements would be relatively easily made available and would also alternatively imply less or little alternative curtailment in other outputs. Both in the urban and in the rural sectors, there is a sizable volume of potential manpower which can be diverted directly or indirectly for defence. In the light of the willingness of the civilian community to accept slight reductions in per capita consumption, it is not beyond India's capacity to raise substantially the strength of our armed forces.

It is estimated that the size of mainland China's army is around 3 to 3.5 million. Besides, China has been having conscription since 1955. The militia of China is put at about 30 million. It is necessary that India, too, will have to strengthen her militia on an equal scale. China has been spending about Rs. 1,000 crores for military purposes in recent years. Her "defence" expenditure forms about 3 to 3.5 per cent of her national income. In 1961-62 India would have spent on defence about one-third of China's outlay on defence. China's national income in 1961 was $1\frac{1}{2}$ to 2 times that of India. As her population would be 1.6 times of India, her per capita income would not be very much different from that of India; Besides, in recent years, the position in regard to per capita availability of essential consumer goods has worsened in China, due to severe setbacks in agriculture. It is reported the failure on the agricultural front has severely reduced industrial output. On account of unbalanced expansion in several spheres, China's present economic status is certainly not such a measure of strength as many people were led to believe in 1958 and 1959. In most respects the economic world has come increasingly to appreciate the economic progress achieved in India under conditions of democracy.

The stepping up of the defence strength implies an expansion in the need of various ancillary services directly required for the defence forces. Besides, there will be an expansion in output and capacity in defence-related industries. Here again, the experience of the Second World War points to an

optimistic portent that the country, in times of emergency, can bring about the needed adjustment to set up output on a considerable scale even at a short notice. The industrial structure of India has gained, during the last decade, in strength and in diversity. The defence production in the country has been expanding rapidly. The country's capacity in various industries alternatively capable of producing defence stores and equipment is quite formidable. In fact, both in engineering and chemical industries our capacity today is greater than the current rate of production. It may be estimated that if the industrial structure of India today switches over to maximum production and the capital equipments are worked to three shifts, the country's industrial output can nearly be doubled.

The chief bottlenecks possibly are electricity, coal, transport and certain strategic raw materials. It is here that greater plan-priority attention has to be given and will be so in the days to come. At the same time, gearing up the country towards maximum mobilisation implies corresponding additional demands on certain essential consumption goods. It is in this respect that the country appears to be certainly in a rather favourable situation vis-a-vis China. The levels of per capita consumption in most essential consumer goods in India today are slightly better than those that prevailed during 1939. Besides, the country is well stocked with food-grains. It is reasonable to hope for large-scale PL 480 imports in case of emergencies. In respect of sugar, clothing, vegetable oils, salt, etc., the per capita levels in India have improved significantly, as compared to the 1939 situation, and appear to be better compared to the situation in China. It may, therefore, be presumed that the country's capacity for mobilisation of crucial consumer goods is decidedly a favourable point in our economic situation.

Besides, the country has built up valuable

experience in the administration of physical controls. Another important measure of strength in the economy is the net-work of State and voluntary organisations that have been developed in the country. The Reserve Bank of India and the financial organisations have expanded their area of operation. The distribution of most strategic investment commodities is under continuous regulation. The channels of economic and other information have been expanded. Today in more senses than one, the country's capacity for emergency economic gear-up has been immensely strengthened in the economic sphere as in others. The country would quickly respond to directions.

As our Prime Minister has very correctly assessed, India will have to keep herself prepared for maximum defence efforts and stay in that position over a long period. Maximum preparedness in terms of mobilisation will have to become a normal part of the functioning of the economic apparatus in the country. Over a longer run, this implies as a corollary the maintenance of a high rate of economic growth and rules out any form of slackness in the economy's tempo of effort.

It is not inconceivable that we may be assisted in our efforts by an increased rate of economic assistance from most nations of the world. In a sense, however, it should be realised that the chief economic responsibility is ours. The cause that the country is fighting for, is sacred to us and under no circumstances should we allow our efforts to flag. During 1961, the country's savings rate was approximately 8.5 percent of the national income. A 5 percent reduction in per capita consumption can step up the savings rate to as much as 13 percent—a rate which would more than match China's savings effort. However, a state of maximum preparedness may call forth the need for a greater order of austerity.

Organisation of Manpower in China

Leo A Orleans*

We in India are interested in the productivity particularly of the neighbouring countries. Now we have particular cause to be interested in the productivity of the Chinese economy. The author has made a study of Professional Manpower and Education in China. In a Foreword to this research publication, Mr Allan T Waterman, Director of the National Science Foundation, wrote as follows: "The development of China as a potential major power is necessarily related to its scientific and technological capabilities. The assessment of these capabilities both for the present and future is dependent to a great extent on a study of its professional manpower resources and its educational system." Hence we have printed below a *precis* of the highlights of the author's analysis. This will help us to understand the productivity of the Chinese system and in building up, on our own lines and in our own light, a system, equal, if not superior in productivity.

CHINA IS UNDERGOING PERHAPS THE most drastic social, political, and economic changes that have been experienced by any country in modern history. Within a period of some 10 years this long-dormant giant has been transformed from a weak, divided, economically backward country, to a unified, regimented, and centrally controlled nation. China is a nation in a hurry, and the Chinese are willing to pay any price necessary to accomplish their goals. Even the most cautious observers must admit that China's economic gains have been impressive, particularly when viewed, not against the often inapplicable standards of the West, but against the China of yesterday. To understand China's education, scientific, and manpower problems, it is helpful to have some notion of the general setting within which the internal changes are taking place.

Undoubtedly the primary factor responsible for China's progress is the establishment of effective controls reinforced by fear, which affords Chinese leaders the means to exercise considerable influence over the nation's

economy and the psychological and physical responses of its people. This control is pervasive and omnipotent. Everyone, from children in nursery schools to the aged in the "happiness homes" feels the hand of the state. In the rural communes, in the factories and mines, in the schools and research institutes, and even in their homes, people are under the guidance of well-dispersed Party members, militia, and the ubiquitous surveillance of block leaders, neighbours etc. The individual must conform, must produce, and must accept the judgment of either the state or his immediate superiors. To maintain these controls, the Chinese leaders are careful to relax these restrictions when the potential reaction to a particular programme may become too violent or when the results do not seem to follow the anticipated pattern. There are additional forces at work in China which give its leaders powerful alliances in their schemes. The most important of these is nationalism, and it is expressed in the pride and the hope of large segments of the Chinese population. *No matter how heavy the burden on the individual, he cannot help seeing the changes around him and be proud that he has*

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had some small role in creating them. There is also hope—not so much hope for himself, for that has long been dismissed by most of the people, but hope for his children and for his grandchildren. They are going to school and there is hope that they will be educated. There is hope that things must get better for they cannot get much worse, and it is the children who will benefit by these improvements: “Look at the Soviet Union,” they say. There is hope for the country, for just think what can be accomplished in the next 20 years if the first 10 are representative; and once again the younger generation will reap the harvest. Realizing fully well the extent to which nationalism, pride, and hope can be made to serve the objectives, the Chinese leaders play up these emotions loud, clear, and often, over radio, over the widespread public address systems, and in compulsory meetings.

It is in this atmosphere that the Chinese leaders have initiated their “leap forward” in education, literacy, and science, and have succeeded, to some extent, in raising the skills and the educational level of the population. It is because of the above factors that they have been able to absorb about 100 million people into their regular school system and an even larger number of people into various types of spare-time and on-the-job training and literacy programmes.

When the present leaders took over in 1949, they inherited a country with an immense population of whom over 80 percent were illiterate, where education was a privilege, people with skills were few, technicians fewer, and higher personnel and scientists even more rare. The tasks of the new regime were well defined. They had to teach people to read and write; they had to expand the educational system to include as many children as possible in as short a time as possible; they had to supply the country with increasing numbers of semiskilled and skilled workers, with semi-professional and professional personnel; they had to insure the present and future needs of the country with the skilled manpower needed to achieve their objectives.

In less than 10 years the new government managed to increase the enrollment in primary schools by some 60 million and in institutes of higher education by some 500 percent. To do this they have had to sacrifice quality—a problem of which they are well aware but consider inevitable at this time. The jump from illiteracy to a first rate educational system cannot be accomplished over a period of a few years; improvements will have to come gradually. The quality of education varies from year to year with shifts in policies and from one school to the next, but the general trend in quality seems to be in inverse proportion to quantity. As the numbers in schools increased, more and more shortcuts were taken. In an effort to achieve universal literacy, simplified characters were taught, and the standards for literacy were reduced. To expand primary and secondary education to include some 100 million children, the quality of instruction was sacrificed. To assure a continuing increase in the number of college graduates, requirements were reduced, and the student was assured success by a proper political attitude.

The “great leap forward” initiated in 1958 compromised education even further. Production became the key word, and everyone from the first grade to the college student had to contribute in some way toward production. While the regular students had less and less time to spend on their studies, more and more people were absorbed into the educational mill on a part-time basis. In 1958 special universities were also introduced to instruct peasants and workers in advanced production techniques. The broad attitude appears to be: “Study, study, study, but remember that *too much book learning is dangerous and a person with practical experience is more valuable than a scholar.*”

There are in China about 625,000 qualified persons with degrees from institutions of higher education whereas prior to 1950 engineers constituted approximately one-sixth of the population with higher degrees, they now constitute 171,700—more than a quarter of the total. The numbers who

have been graduating in the fields of education and medicine have also shown sizable proportional increases, while the graduates in the sciences have increased in number but remained fairly constant in proportion to the total. Most of the emphasis on engineering, medicine, and education has been at the expense of such fields as law, social sciences, finance and economics.

The general quality of the present college graduates in China is usually quite low. Those who received their training in the West prior to 1950 and the few thousand selected students who have been trained in the Soviet Union since then remain the core of the professional manpower.

Scientific research is conducted at the various institutes of the Academy of Sciences, at educational institutions, and at some of the industrial enterprises. However, there are two major limiting factors as to quality and quantity of the research performed. The number of highly qualified personnel capable of advanced scientific research is small, and the major emphasis in research is on its immediate application. From the practical point of view it is more expedient at this stage of development for Chinese scientists to borrow existing knowledge from the more advanced nations and convert it to the special needs and the present level of Chinese technology. It is here that the Chinese scientist can make his greatest contribution.

There is an apparent shortage of technical personnel at both the professional and semi-professional levels. Additional technicians could be put to good use and would make a considerable contribution to China's present economy and to its future rate of growth. However, they do not represent the solution to China's economic problems. Some form of balance must exist between the technical personnel and the overall level of a country's economic development. The growth in the numbers of engineers and technicians must go hand in hand with the gradual development of heavy industry, with greater yields from agriculture, with the production and importation of the

necessary machinery and equipment, and with a faster rate of capital accumulation. To say that a shortage of technical and scientific personnel is a major factor in limiting the rate of China's development is to oversimplify the many problems that are facing her today.

What of the future of education, professional manpower, science and technology in China? Predictions and projections for China are extremely hazardous and vulnerable. Flimsy trends and indices are of little practical value in projecting either statistics or concepts even to a few years hence. What may seem to be a trend is often wiped out overnight by a new policy or by different assessment of the statistics. Only broad general conjectures may be expected to weather the unpredictable nature of developments within China.

At a primary level, universal education for the full 6 years is not likely to be attained in China in the foreseeable future; participation rate will probably continue to grow but at a much slower pace. Great emphasis will probably be placed on the vocational schools to fill out the needs for skilled manpower, and on the normal schools to increase the ranks of trained teachers. Because of increased enrollment in higher education during the past few years, the number of graduates will greatly increase despite the fact that enrolment will level off.

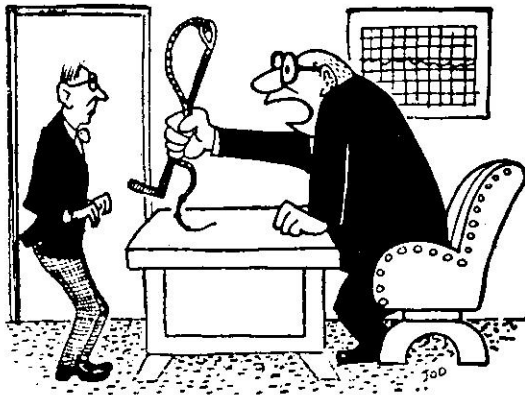
Raising the low standards of education will be extremely gradual. As the numbers at the various educational levels become stabilized, additional emphasis will be placed on quality; this will coincide with an increase in the number of more qualified teachers. At all levels, but especially in higher education, the quality of the graduate will be closely related to the degree of emphasis on labour and the time that students will be expected to contribute to production. The difference in standards and quality between urban and rural schools will persist.

The number of professionals with higher education is currently increasing at approx-

ximately 10 percent annually. This rate of increase may accelerate slightly during the coming years. The emphasis will continue to be on the technical and engineering personnel. The professional level of these individuals will in no sense be comparable to that of graduates of universities in the West. However, increasing number of select Chinese students will probably get advanced training in the Soviet Union and will achieve a fairly sophisticated level in their field. For some time to come the emphasis will continue to be on the practical application of scientific knowledge to various types of production.

Finally, at the risk of being accused of

being a neo-Malthusian, it is suggested that the extent of China's achievements, the fulfillment of her plans, the speed with which she will attain industrial and economic goals will, to a very large extent, depend on her ability to limit the excessive rate of growth of her population—one brief attempt at population control was abandoned as a national policy in 1958. Despite the very impressive progress that China has been able to achieve during the past 10 years, the burden of the fifteen or more million people added to her population every year may be too overwhelming for China to emerge as a modern industrial power.



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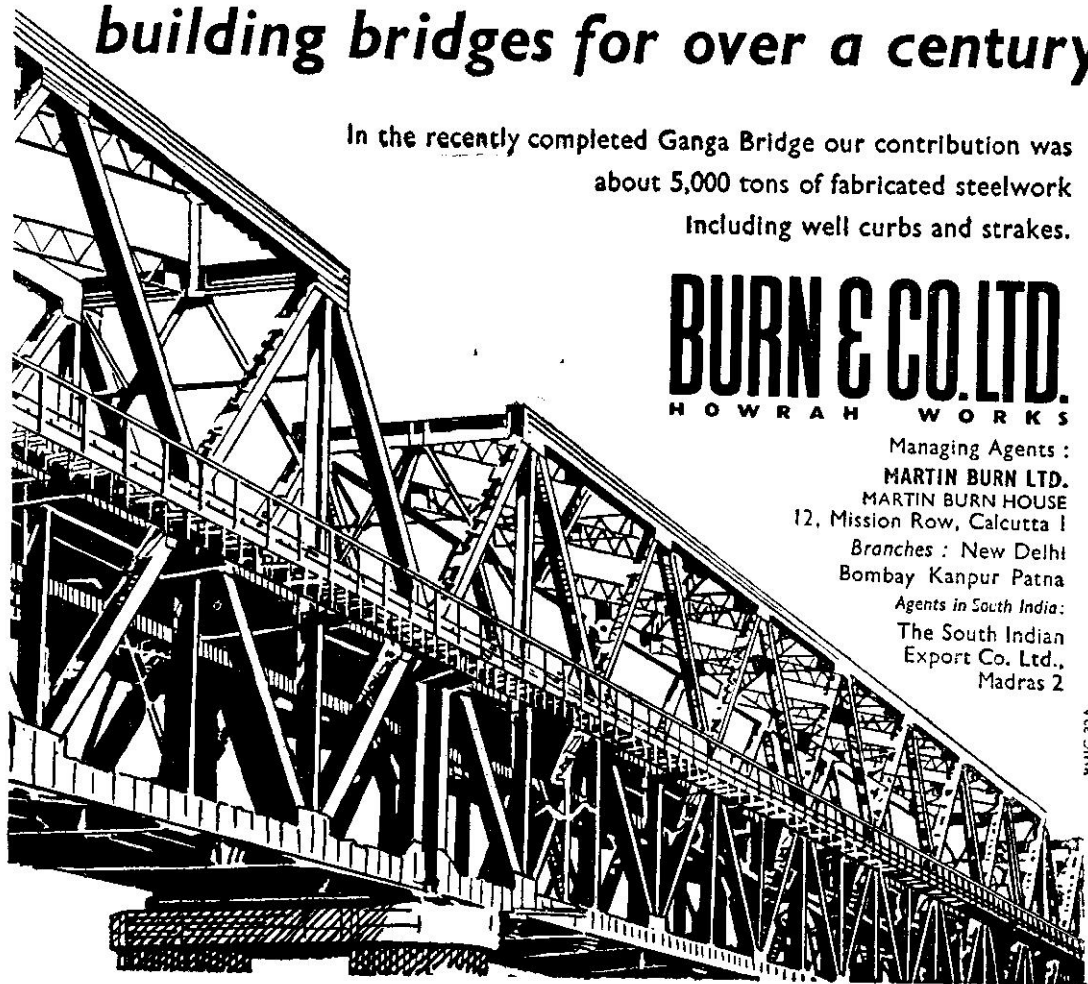
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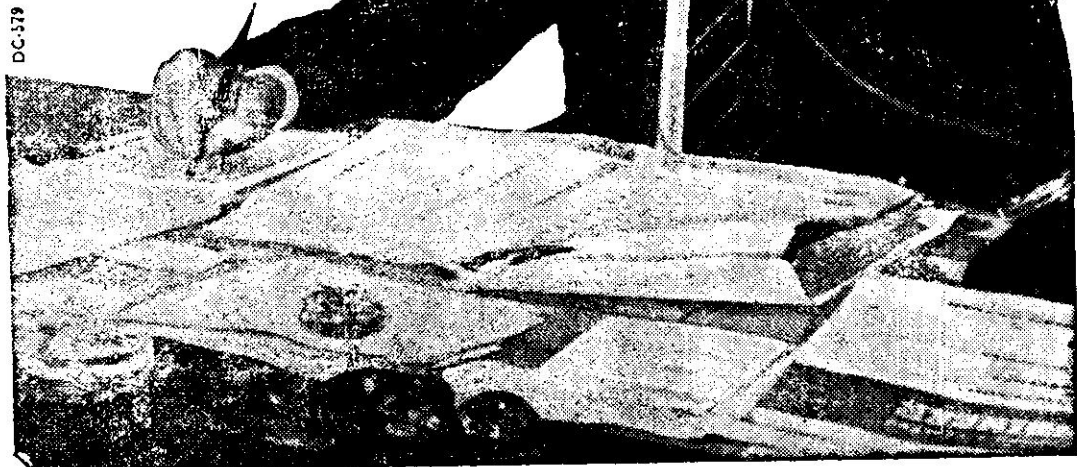
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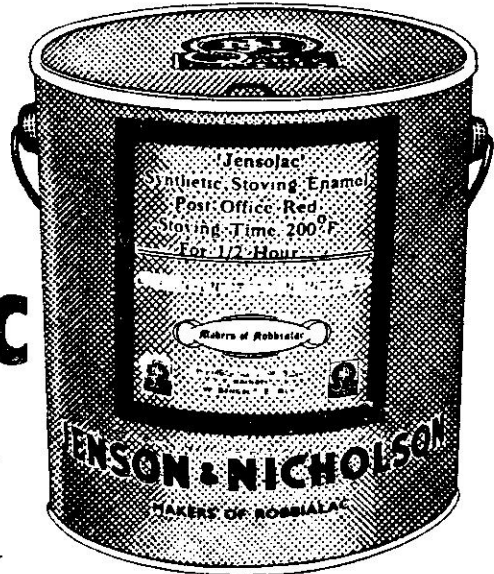
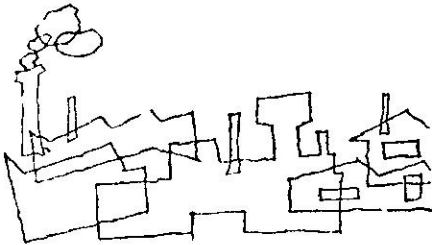


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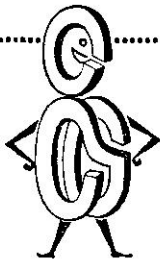
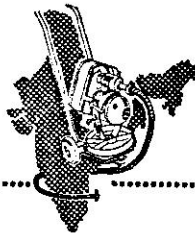
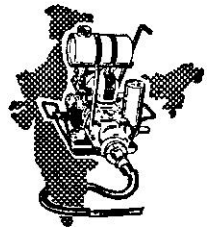
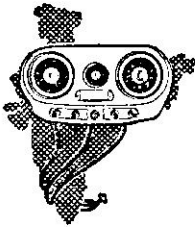


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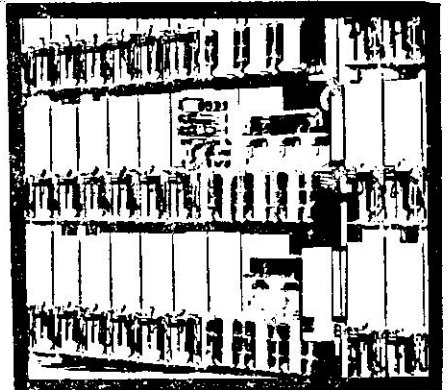


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Some Aspects of Leadership Qualities

Nitish R De*

The author had prepared this piece long before the National Emergency supervened. Its contents have however now acquired a typicality, for productivity has now come into its own in the area of Defence mobilisation. The author has enriched his analysis with citations from the lives of people such as Abraham Lincoln, Winston Churchill, Eisenhower and Montgomery, who in times of crises in their country's destiny, carried out major tasks in defence mobilisation, such as has become the destiny of the people in charge of affairs in our country. Leadership has been usually associated historically with religion or politics. The author has however shown how these qualities of leadership can be identified and utilised to build up and to mass defence potential at this time of crisis.

Peter F Drucker, an original thinker on management science, considers Leadership as a human characteristic which lifts a man's vision to higher sights, raises a man's performance to higher standards and builds a man's personality beyond its normal limitations. The significance of this can easily be grasped by considering what its absence would have meant in the history of human achievement in any field. Imagine for instance cricket without Grace, Jardine or Bradman; English history without Oliver Cromwell, John Moore, Horatio Nelson or Winston Churchill; the American industrial revolution without Henry Ford or Andrew Carnegie; modern Science without Neils Bohr, Albert Einstein or Madame Curie. One could multiply such instances almost *ad infinitum* to show what a poor world it would have been without these outstanding personalities.

IN RECENT YEARS A VOLUMINOUS LITERATURE HAS GROWN UP on various aspects of leadership but practically all well-known authorities are agreed on basic concept of leadership. It is decidedly a fact that these dark figures of history could be credited with elements of leadership, but when one takes into account their objectives and/or the methods adopted to gain the objectives, they appear as leaders of negative and futile value. Viewed in the context of human civilization or culture this is indeed clear but the distinction is not so obvious when we consider leaders like General Lee of American Civil War fame or Manstein or Guderian or Rundsted of Hitler's army. For, although ultimate success was not their's but in the assessment of a leader other essential qualities which we shall discuss presently are of equal importance. In Aldous Huxley's phrase, ends and means are both of cardinal value.

Even though Peter Drucker is highly critical of any training method to build up leadership qualities the one effective means of grooming budding leaders is to underscore the essential qualities which combine in a man to throw him up as a leader. The most that one can do is to inculcate these qualities in one's thought and action in one's sphere of responsibility.

We may indicate hereunder in a tabular statement what some thinkers consider as essential qualities of a Leader.

*Personnel Manager, Indian Aluminium Co. Belur, Calcutta.

Source	Slim	Tead	Foyal	Barnard	Hill
Qualities	1. Courage 2. Willpower 3. Judgment 4. Flexibility 5. Knowledge 6. Integrity	1. Physical and Nervous Energy 2. Enthusiasm 3. Sense of Purpose and Direction 4. Technical Mastery 5. Integrity 6. Technical Skill 7. Friendliness and Affection 8. Decisiveness 9. Intelligence 10. Faith	1. Health and Physical Fitness 2. Intelligence and Mental Vigour 3. Moral Qualities 4. Knowledge 5. Managerial ability	1. Vitality and Endurance 2. Decisiveness 3. Persuasiveness 4. Stability of Behaviour 5. Intellectual Capacity 6. Knowledge	1. Courage 2. Self-confidence 3. Moral Qualities 4. Self-sacrifice 5. Paternalism 6. Fairness 7. Initiative 8. Decisiveness 9. Dignity 10. Knowledge of Men

We need not be befogged at the absence of agreement among these thinkers on the essential requisites of a Leader. FM Viscount Slim has chosen six basic essentials primarily for military leadership even though these can apply with equal force to leadership in other walks of life. Foyal and Barnard on the other hand speak essentially of leadership in industrial and business world. Tead and Hill are more elaborate in their assessment of leadership qualities. On a careful consideration of meaning attached to these qualities by different thinkers one could broadly classify these essentials into distinct categories. It would be our endeavour to identify these categories by some selected illustrations so that the meaning and significance of these categories become clear and apparent.

That a leader must possess to a high degree physical and nervous energy is almost axiomatic. He must have conspicuous drive, more endurance and greater vigour of mind and body. He must have never failing enthusiasm to stand up to stress and strain of high office and higher responsibility. He must have dynamic emotion, hope, will to win and a sense of robust joy in his mission.

An obvious example is our Prime Minister Nehru. His vitality even at his age, enthusiasm and capacity to endure the burden of high office with ease and cheer are known to us. What is, however, relevant in this connection is that his sound constitution is greatly a product of his conscious effort. He did not spend his time and energy in idleness or purposeless living during the period of incarceration. As he put it himself :

“... gaol was gaol and the oppressive atmosphere of the place was sometimes almost unbearable. The very air of it was full of violence and meanness and graft and untruth;... And I managed to accustom myself to the gaol routine, and with physical exercise and fairly hard mental work kept fit. Whatever the value of work and exercise might be outside, they are essential in gaol,

for without them one is apt to go to pieces. I adhered to a strict time-table and, in order to keep up to the mark, I carried on with as many normal habits as I could, such as the daily shave....”

Not only the daily shave but his routine of gardening, walking up and down in the room or corridor and the rigid discipline of writing books amply demonstrate his preparation for the hard life of the future and how hard this life could be at times has been admirably depicted by HVR Iengar in his assessment of the P.M. at work.

We may take another instance. Thomas Edison, a man without formal education, who patented in his lifetime 1093 inventions, was reputed for his vigour and endurance. He usually worked 18 or more hours a day. His widely reported ability to get by with no more than four hours' sleep with an occasional catnap was no exaggeration.

It would, however, be wrong to presume that physical handicap is an insuperable barrier to one's becoming a true leader. Take for instance the case of Admiral Dudley Pound, the war-time Chief of the Naval Staff in the UK. He was then suffering from a pernicious malady of the brain. His pain and physical discomfort were great but in the supreme needs of the nation he subordinated his physical handicap to the call of duty till he finally fell a prey to the disease.

Another amazing case-study is provided by Dr Tom Dooley, an American surgeon, who, having resigned his commission from the Navy went to Laos to bring healing and help to distant villages. He conceived the idea of Medical International Cooperation—an association of medical missionaries devoted to treating the sick in remote areas of the world. Deeply immersed in his work, crying always that there was only 24 hours in a day, Dr Dooley starting with two small hospitals and a handful of colleagues expanded his project to 15 major enterprises in 12 countries and all the while he was suffering from malignant melanoma, an agonizing, rapidly fatal cancer. Physically crippled, slowly and steadily approaching his doom, Dr Dooley often ignored his own illness to carry on emergency operations. So, when he breathed his last it was said of him that “in his 34 years he had done what very few had done in the scriptural lifetime.”

It is thus obvious that while the present-day fashion of shortened working week with more leisure and recreation would be proper for ordinary men and women, aspiring leaders would invariably have to adopt a rigorous routine of long, hard work and life of physical stress and strain shorn of many a pleasure and comfort of modern living. But it is necessary to emphasise that it is vital that there is some relief from the tension of higher responsibility. It is not for nothing that Winston Churchill, during war years, would run away at times from his London office to the countryside or sea, which the Soviet Premier Nikita Khrushchev now frequently does or that Pandit Nehru would take a fascination to the Himalayas and other hills; or that FM Alanbrooke, Chief of the Imperial General Staff during wartime would take to angling and bird-watching; or that Albert Einstein would take to the violin during leisure and Robert Oppenheimer would take to Sanskrit literature as a pastime.

Even with this measure of escape it is doubtful if bouts of temper, occasional outbursts and moodiness could be altogether eliminated. This is what we get from Alanbrooke's memoirs :

“... The Chief of Air Staff had tried to stop the Prime Minister from committing himself irrevocably to a promise to transfer ten squadrons from North Africa to Russia at the end of the Libyan offensive. This produced the most awful outburst of temper. We were told that we did nothing but obstruct his intentions, we had no ideas of our own and, *whenever he produced ideas, we produced nothing but objections*, etc. etc. Attlee pacified him once but he broke out again, then Anthony Eden smoothed him temporarily but to no

avail. Finally he looked at his papers for some five minutes, then slammed them together, closed the meeting and walked out of the room. It was pathetic and entirely unnecessary. It is all the result of overworking himself and keeping too late hours."

We may cite another instance from the same source :

"Archie Wavell's personal assistant arrived while I was shaving with a note from Archie in which he said that he had been unable to sleep and was so upset by Winston's reference to the Burma operation that he proposed to send him the letter which he enclosed. In that letter he said that since Winston had lost confidence in him it was better for him to send in his resignation. I went round and saw him and advised him not to send the letter... I remember that when I was discussing the matter with Wavell and trying to stop him from sending in his resignation, I told him that if I were to take offence when abused by Winston and given to understand that he had no confidence in me I should have to resign at least once every day. But that I never felt that any such resignations were likely to have the least effect in reforming Winston's wicked ways."

The one purpose of citing these instances involving Churchill and Alanbrooke is to show the latter's admirable adaptability to the ways of a great leader like Winston Churchill.

Among the moral qualities courage—not in physical sense alone—but moral courage is essential. As FM Slim says—*without courage there are no virtues*, for faith, hope, charity and all the rest do not become virtues until it takes courage to exercise them. Moral courage enables a person to stick to, without faltering, a determined course of action which his judgment has indicated as the best suited to secure the desired results. Assailed by doubts, misgivings or even external pressure a leader should not change his decision unless it is clearly manifested that his earlier decision was radically wrong. It is again the dictates of moral courage that *one should take the responsibility of his action and not pass on the blame, should the action be blameworthy, to one's subordinates.*

That physical courage at its highest merges in moral courage to promote morale can be gauged from one example given by FM Viscount Slim during the dark days of the Burma campaign when the Japanese aggression was on top :

"Returning from Taungdwingyi late that afternoon, we found 48 Brigade had just cleared the main road of a big Japanese infiltration party that had tried to put a block across it. Our car was held up as the fight was still going on and the enemy was shelling a bridge over which we had to pass. Their shooting was not very effective but they might score a bull in time, so I whistled up a couple of light tanks that were standing by and suggested to General Alexander that he got into one and I into the other to cross the bridge. . . . "What about my car and the driver?" he asked at once. . . . "Oh, he'll have to stand on the gas and chance it", I replied. . . . "But it'll be just as dangerous for him as it would be for me." "Yes, but he's not the Army Commander". . . . "All right," said Alexander. "You go in a tank. I'm staying in the car." So, of course, we both went in the car."

Here is another illustration of a very distinguished American surgeon Dr William Mayo who had the moral courage to admit his lapse which at the same time he rectified with his mastery skill :

"One day he was removing a tumour of the kidney. As an upheaval of the ocean floor might render useless the navigator's charts, so the huge growth had pushed all the familiar surgical landmarks out of place and attached itself to the adjoining body parts. As Dr Mayo lifted it to the surface, the largest vein in the body was ruptured; blood welled forth in a horrifying flow that would have ended life in a few minutes. . . . With one flash of his finger Dr Mayo found and plugged the rent, entirely by his trained sense of touch, for the blood shut everything else from sight. . . . Then he said quietly to the tense watchers, "Gentlemen, I have torn the vena cava and it will be necessary to make another incision to repair the vein." He stitched up the tear, made sure it was tight, and then went calmly on with the task of cutting the growth away from the tissue to which it was attached. Suddenly the tumour came loose, making a tear in the bowel. Dr Mayo continued talking: "This, gentlemen, is a much more serious accident than the injury to the vein. I have torn a long rent in the duodenum and if it is not made intact, the contents will leak out and the patient will live but a few days." Then slowly and carefully he sutured the torn bowel before he went on to complete the work on the kidney. The operation took three and a half hours. At the end the spectators were exhausted by the strain and stared in awe at the outwardly unperturbed man who had carried the responsibility."

A perfect example of owning up to one's responsibility in a decision is provided by Abraham Lincoln.

"After the battle of Gettysburg, Lincoln urged General Meade, in a peremptory order, to pursue Lee in his retreat, attack him, and with one bold stroke, end the war." A friendly note came with it: "The order I enclose is not of record. If you succeed, you need not publish the order. If you fail, publish it. Then, if you succeed, you will have all the credit of the movement. If not, I'll take the responsibility."

Here is another instance, from the same source, of transparent honesty which is in the nature of moral courage at its zenith:

"Abraham Lincoln wrote to General US Grant, the hero of the Civil War: "I do not remember that you and I ever met personally. I write this now as a grateful acknowledgement for the almost inestimable service you have done the country.

I write to say a word further. When you first reached the vicinity of Vicksburg, I thought you should do what you finally did . . . and I never had any faith, except a general hope that you knew better than I that the Yazoo Pass expedition, and the like, could succeed. When you got below and took Port Gibbon, Grand Gulf and vicinity, I thought you should go down the river and join General Banks; and when you turned northward, I feared it was a mistake. *I now wish to make the personal acknowledgement that you were right and I was wrong.*"

Another aspect of moral qualities is an unfaltering attitude of friendliness and affection, tolerance and patience. This attitude, as is apparent, lies not in what a leader says or feels but in what he does. This virtue should primarily be manifest in his action. Some of the world's well-known religious leaders, like Jesus Christ, Lord Buddha and prophet Mohammed, represent the best tradition of this aspect of leadership. In the political field Mahatma Gandhi, Jan Smuts, Vladimir Lenin, Abraham Lincoln and Thomas Jefferson

are indeed justly famous for this quality of their character. Here is an interesting example of what leadership quality can really mean :

Stanton said—and Lincoln heard him say it : “I will not associate with such a damned, gawky, long-armed ape as that. If I can’t have a man who is a gentleman in appearance with me in the case, I will abandon it.”

“I have never before been so brutally treated as by that man Stanton”, Lincoln said. He returned home, mortified, sunk, once more in terrible melancholy.

When Lincoln became President, Stanton’s contempt and disgust for him deepened and increased. He called him “a painful imbecile”, declared that he was utterly incapable of running the Government, and that he ought to be ousted by a military dictator. Stanton repeatedly remarked that Du Chaillu was a fool to run off to Africa, looking for a gorilla, when the original gorilla was, at that moment, sitting in the White House scratching himself. In his letters to Buchanan, Stanton abused the President in language so violent that it can’t be put into print. When there was the vacancy for Secretary of War, a crucial post during the Civil War crisis, Lincoln said to a friend : “I have made up my mind to sit down on all my pride—it may be a portion of my self-respect—and appoint Stanton Secretary of War.” That proved to be one of the wisest appointments Lincoln ever made. Stanton stood at his desk in the war-office a regular tornado in trousers, surrounded by clerks like eastern slaves before their Pasha. *Working day and night, refusing to go home, eating and sleeping in the war-office, he was filled with wrath and indignation by the loafing, swaggering incompetent officers that infested the army.* And he fixed them right and left and backward and forward. For years Stanton had been racked with head pains, had suffered from asthma and indigestion.

However, he was *driven like a dynamo by one absorbing passion : to hack and stab and shoot until the South came back into the Union.* Lincoln could endure anything to achieve that goal.

One day a Congressman persuaded the President to give him an order transferring certain regiments. Rushing to the War Office with the order, he put it on Stanton’s desk; and Stanton said very sharply that he would do no such thing.

“But,” the politician protested, “you forget I have an order here from the President.” “If the President gave you such an order”, Stanton retorted, “he is a damned fool.” The Congressman rushed back to Lincoln, expecting to see him rise up in wrath and dismiss the Secretary of War. But Lincoln listened to the story, and said with a twinkle in his eye : “*If Stanton said I was a damned fool, then I must be, for he is nearly always right. I’ll just step over and see him myself.*” He did, and Stanton convinced him that his order was wrong and Lincoln withdrew it. Realizing that Stanton bitterly resented interference Lincoln usually let him have his way.

“I cannot add to Mr. Stanton’s troubles”, he said. “His position is the most difficult in the world. Thousands in the army blame him because they are not promoted, and other thousands blame him because they are not appointed. The pressure upon him is immeasurable and unending I do not see how he survives, why he is not crushed and torn to pieces. Without him, I should be destroyed.”

Occasionally, however, the President “put his foot down”, as he called it; and then—look out. If “old Mars” said then that he wouldn’t do a thing, Lincoln would reply quietly : “I reckon, Mr Secretary, you’ll have to do it.” And done it was. In the end Stanton and Seward and most of those who began by reviling and scorning Abraham

Lincoln, learned to revere him. When Lincoln lay dying in a rooming-house across the street from Ford's theatre, the iron Stanton, who had once denounced him as "a painful imbecile," said, "There lies the most perfect ruler of men the world has ever seen."

Here is another example of how a great leader, because of his affection for and consideration of his men, would behave in an apparently rude manner :

During the Sicily campaign, "the first landing had come through with a rush but a choppy sea was running and the boat commanders were protesting that they could not get the heavy equipment ashore. Montgomery sent for the commanders on the beach. They had to get their cargoes ashore. He did not care how they did it but the equipment had to be delivered within twenty-four hours. That was the deadline. No excuses would be acceptable. . . . He would listen to no arguments; he seemed oblivious of any losses he took and he was quite capable of dismissing anyone—even a general—on the spot These outbursts were reserved for the senior officers; the soldiers knew nothing of them and quite possibly, as they cheered him along the road, they would have relished the information that he had just been extremely insulting to one of their commanding officers." Rather odd and even reproving but the real reason is that such slackness on the part of commanders would inevitably mean heavy loss in manpower and delay in achieving the result costing many more lives. Montgomery himself provides the answer: "I have always stood not only for the need to win victories, but to win them with the minimum loss of life."

A true leader, since his friendliness and affection is genuine, would even show the same attitude towards his enemy. Basil Embry, who later on rose to become an Air Chief Marshall in the Royal Air Force, was shot down in France and held prisoner. He was taken to General Hans Guderian, creator of German Panzer forces and one of the most original of German commanders in World War II. Let Basil Embry speak for himself:

"I was ordered into the back of his car, the staff officer sitting beside me with an armed escort standing on the running-board. I was very impressed by Guderian's poise and bearing; he was of medium height, dapper and crisp in his manner, and I am sure he was well liked by his troops as I could sense that *those we passed were glad to see him*, and he in return seemed pleased to be among them. We were held up many times by tanks, and I noted that all the tank commanders, saluted him with an air of enthusiasm and that he was punctilious in acknowledging them. I thought there was not much of the Nazi general about him; he might almost be British ! As it started to get dark, he noticed that I was shivering with cold and, picking up the great coat beside him, handed it to me. I thanked him gratefully and continued my journey dressed as a German General."

Along with these qualities a leader must possess a sense of fair-play and justice, for, bereft of these qualities, he cannot expect to motivate his men into action, to raise, as Peter Drucker puts it, a man's performance to higher standards. Here is an illustration: "For a very long time it had been the practice of British generals to appoint to their staffs wealthy and influential young men, the sons of dukes and earls and baronets. And sometimes these young men, especially when they entered politics, were useful to the generals in later life It was simply an extension of the "old school tie" system, the system of a social class looking after its own.

With this business Montgomery would have no truck at all. No one with a title got on to his staff. Pure merit was the only way of getting there and staying there. He

was entirely devoid of snobbery, entirely uninterested in money and not at all concerned about his future career outside the Army." It is thus understandable why thousands of men gave their best for him in the 8th army in Africa and 21st Army group in Europe.

In fact, one could hardly over-emphasize the importance of moral qualities in the make-up of a leader. *A pure luminous heart seeking other hearts in love and esteem can do miracles.* In industry one can find the best exponent of this attitude in Charles Schwab, one of the highest paid executives in the United States Steel Industry. Schwab's great secret of success was this :

"Charles Schwab was passing through one of his steel mills one day at noon when he came across some of his employees smoking. Immediately above their heads was a sign which said, "No smoking". Did Schwab point to the sign and say, "Can't you read?" Oh, no, not Schwab. He walked over to the men, handed each one a cigar, and said, "I'll appreciate it, boys, if you will smoke these on the outside." They knew that he knew that they had broken a rule—and they admired him because he said nothing about it and gave them a little present and made them feel important. Couldn't keep from loving a man like that, could you?".....

And what can the result of such attitude be one can find from this :

One mill was not giving its quota of production. The mill manager reported that his threat or curse was of no use. Workers would not give more production. It happened to be the end of the day, just before the night shift came on. With a piece of chalk in hand Schwab turned to the nearest man: "How many heats did your shift make today?"... "Six."... Without another word, he chalked a big figure of six on the floor, and walked away. When the night shift came in they saw the figure '6' and asked what it meant. "The big boss was in here to-day," the day men said. The next morning Schwab walked through the mill again. The night shift had rubbed out '6' and replaced it with a big '7'. When the day shift reported for work the next morning, they saw a big '7' chalked on the floor. So the night shift thought they were better than the day shift? Well, day shift pitched in with enthusiasm and when they quit that night, they left behind them an enormous, swaggering '10'. Things were setting up. Shortly this mill was turning out more work than any other mill in the plant.

In this connection, one would reasonably expect the leader to possess a high degree of integrity which really means a reasonable harmony and consistency of the motives which are evidenced in the leader's public and private affairs. One sure way of evoking a sense of loyalty in subordinates, is, for the leader, to be known as a person of integrity. This is demanded, all the more, for a different reason. As Tead says, in a complex society there are conflicting demands upon the time of people and upon the amount of attention each can devote to the several groups to which he belongs.

We may cite a simple instance, again from the life of Winston Churchill :

"During the first months of my employment meat was still rationed and often very short indeed. It is probably of interest . . . that a man in such a position as my Guv'nor (i.e., Prime Minister Churchill) would eat no more than the least important person in the country. . . . On one occasion, indeed, when a local butcher had surplus meat and was rather generous in his allocation to the household, my Guv'nor made a strong protest and said that in no circumstances was any extra above the ration to be accepted. Often indeed, we individually had less than our ration and I should stress that everybody in the household from the most junior kitchenmaid to my Guv'nor and his

wife, shared and shared alike, so that the cook had to exert miracles to stretch the food out for the numerous guests which they entertained."

Yet another illustration is here from the life of Thomas Jefferson, a great US President: On one point the President was adamant. He absolutely refused to appoint kinsmen. Nepotism was a hateful idea. . . . No one, Jefferson said, would believe that a relative was given a job because he happened to have a merit."

For a successful leader qualities of head are as important as those of heart. If Albert Einstein is the leader of twentieth century scientists or Pablo Picasso of modern artists or Charles Chaplin of modern film-makers, each one is so because of his mental qualities even though there are other admirable qualities in each of them.

To start with, a leader must have knowledge. As Slim puts it, he must keep a jump or two ahead, not only of competitors or enemies, but also of his followers, otherwise he has no justification for trying to lead them. He can, therefore, never afford to stop learning. It should, however, be emphasized that the nearer a man gets to the top the more will he need knowledge to understand expert, scientific or technical advice; when to accept it, change it, or reject it. Knowledge of a subject or a technique is important but what is more important is the knowledge of men working under a leader. . . . We may consider this illustration:

Montgomery did not possess a notably detailed knowledge of engineering, of signalling, of medicine, or ballistics or logistics or any of the other intensely intricate departments of a modern army, except possibly infantry tactics. His knowledge was general and he deliberately kept it general. As soon as he was confronted with a technicality he at once demanded, "Who is the expert? Bring him here." On the arrival of the expert he looked him over shrewdly. Moving on the presumption that a man of character and decision will be good at whatever job he is doing he looked for these virtues in the expert. Finding them he would say shortly: "Very well. You know all about it. You take charge," which was stimulating for the expert and made him work keenly. This was why Montgomery was so exceptionally successful in the selection of his subordinates.

To build up an efficient team on the basis of one's knowledge of his men has also been the secret of success of Charles Schwab, Andrew Carnegie, Abraham Lincoln, Vladimir Lenin and many others.

Along with knowledge, a leader must possess two other conspicuous qualities—decisiveness and initiative. He must at some stage or other take decisions to achieve his object: vacillation is fatal for a leader. Prince Hamlet may be a man of conscience but because of "to be or not to be" attitude he would always make a poor leader. Just consider this great moment of history when decision had to be taken on the Normandy campaign which would mark the beginning of the end of World War II:

Suddenly the weather across the English Channel developed badly. Invasion was almost impossible and decision on D-Day was postponed temporarily. But in spite of beastly weather a decision had to be taken on 5th June, 1944. Around the conference table were Eisenhower, Tedder, "Beetle" Smith, Montgomery, Ramsay and Leigh-Mallory. The weather experts were called in. Tuesday (June 6th) would be windy but not stormy. . . . The long-range forecast remained unchanged; a "December depression" was moving in.

Eisenhower then reviewed aloud the factors which must be considered and called for opinions.... Leigh-Mallory indicated that he was willing to take what they all recognised as a gamble. Ramsay said, "If the 'Air' thinks he can do it, the Navy certainly can." There was silence. All looked toward Eisenhower, who was plunged now into one of those moments of terrible solitude which, again and again in recent years, had measured his inner resources He must make the decision. He simply weighed rapidly in that remarkably logical mind of his the factors of the situation. The troops were all set; A promise made to Stalin was already in default by several days. Public opinion in America and Britain clamoured for action question of surprise leakage of information Adding them up that way, the risks of delay outweighed the risks of immediate action—even though, as it turned out, they had the worst weather in forty years in Normandy. "All right," Eisenhower said, "we move"

There should, however, be a word of caution. Rigidity of decision is the way of an autocrat. Success warrants that a leader should have an attitude of flexibility. Today, when conditions in all spheres, political, social, industrial and scientific change with bewildering rapidity, flexibility of mind is vital. As Thomas Carlyle said, "A foolish consistency is the hobgoblin of a little mind."

Another requisite quality, as we have already mentioned, is initiative, which simply means that it is doing the right thing without being told. Here is an illustration :

Group Captain Leonard Cheshire received the Victoria Cross twice during World War II and was considered as one of the best pilots. While in the 76 Squadron he took initiative in forming "The Plumbers' Club" for the ground crew who used to meet once a month to discuss every conceivable aspect of their various trades. They had an emblem for their club, which was a large monkey-wrench held in an oily fist, and beneath it was printed the exhortation to their aircrew colleagues, "You bend 'em: we mend 'em." As a result of this morale-building effort, where all grievances could be aired, all information pooled and flyers could meet technicians, 76 Squadron, in spite of almost continuous activity against the enemy, led the whole of the Bomber Command in the number of planes always available for service.

In fact, given a sense of purpose and direction, i.e. a clearly defined objective, a leader, whether he is a social reformer like Iswar Chandra Vidyasagar or an educationalist like Madame Maria Montessori or an industrialist like Sir JN Tata, his success or failure very much depends on his initiative in organising the means to achieve his objective. In the process the leader has to prepare himself for a rough sea: opposition, callousness, ridicule and all the rest of it. A leader, in other words, has to prepare himself for all these which would involve a good deal of sacrifice. Depending on the circumstances the sacrifice may take the shape of time and energy or financial resources or even stark physical torture or persecution as in the case of Socrates and Jesus Christ.

Those who know the fascinating story of discovery of radium are aware what a great struggle it was for Marie and Pierre Curie—their long hours of work day and night bereft of sleep and leisure, privation, moments of frustration and denial of hundred other pleasures of life.

We have tried to, in our survey, bring out some of the essential characteristics of Leadership and group them under physical, moral and mental qualities. What is, however,

of importance is that a leader *has to have these qualities integrated within himself*. Just as a herculean stamina will alone fail to carry a person on to the top, preponderance of moral virtues and absence of mental qualities is likely to make him an ineffectual moralist crying in the wilderness in self-pity and frustration.

A leader has to become and remain "the whole man" so that he is capable of standing alone, fit to be trusted with power, a strong but humble individual who has learnt that *the reward for good service is a demand for more service*. As Noel Frederick Hall puts it, one of the ingredients in developing this capacity is to discharge one's own responsibility. And it is judgment, the capacity to apply knowledge and the fruits of experience, that grows with the carrying of responsibility.



Personality and Productivity

KC Sekharan*

This really is an extract from a metaphysical treatise, intended to analyse life at its grass roots. In the course of his analysis, however, the author has examined the dynamics of human personality in a manner which has a distinct bearing on the dynamics of productivity. Modern researches have established that the motivational factors and the constituent elements of human personality which at one time combined to spark leadership in the fields of religion and politics are almost exactly the same as are required in the field of industrial mobilisation. No longer are workers, foremen and middle managers willing to work as cogs in the industrial machinery. They have to be led appropriately by managers who combine a balanced personality with imagination and drive. It is only thus that a large scale industrial society can operate to its optimum level of productivity. The depths of the inner being which the author seeks to plumb in the course of his rather profound analysis, the sub-conscious mind as it functions in ordinary life as also in the life of the spirit, the devotion which such people as Franklin Roosevelt, Swami Vivekananda and Mahatma Gandhi inspired, is exactly the sort of devotion required, for example, for industrial mobilisation for defence. American industry has reached the heights of productivity because of the association with it at its critical points of such men as Henry Ford, Edison and Charles Schwab.

WHAT SHOULD BE THE NATURE OF THE combination of the various constituents of personality to ensure its full and harmonious development. Dynamism, direction and moral development should all be present in a high degree and blended in equal proportion or at least the proportion of the constituents should not vary much. This would give great strength and at the same time, balance to the personality, ensuring increasing success over a long period of years. A personality in whom one or two of the constituents are in a very high proportion may sometimes acquire great strength, but lack balance. For example, the passions and imagination may be so strong as to overwhelm the other elements. This gives the whole nature an intensity. While there may be complete lack of balance, there may be great power in the individual on account of the total strength.

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Van Gogh, the great artist of genius, may be cited as an example of an unbalanced personality. This imbalance in personality is caused largely by the excessive presence of animal spirits, associated with youthfulness. With age, however, these passions get sublimated but may yet retain their vitality by the process of transformation and blend with other constituent elements of personality. With age, imagination also somewhat weakens under the pressure of reality. But if one has found ways and means of translating his 'dreams' into reality, imagination has a healthy influence throughout life. Therefore, through the sublimation of the passions and transformation of 'dreams' into realities, one may continue to be dynamic. Then the passions and the imagination do not disturb the life, but by integration with the other constituents of the personality promote balanced development and vest the whole personality with great power and strength of expression. A vast fund of psychic energy is then released from the

unconscious part of the mind to be utilised by the conscious part of the mind for the full development of its potentialities. In the context of this analysis, we may try to work out the various constituent elements of personality as found in the lives of some eminent persons recognised as great artists, scientists, statesmen and humanitarians during the ages at which they had attained the height of their development.

It will be seen that while the maximum score of an average person at the best time of his life is only 100, in all these cases where the persons have been remarkable for their achievements, their scores are very much above the average. They range from 108 to 125. From these examples, it will be seen that for fulfilment, the moral constituents of the personality should be strong. This comes with age. In a few exceptional cases, as in the case of Swami Vivekananda, it was very strong even in youth. He realised the height of fulfilment at the age of 35-38 and passed away at the age of 39. The moral elements have also to be fairly balanced with the other elements of personality. This will be clear from the examples of Lincoln, Roosevelt, Nehru, Einstein, Vivekananda and Gandhi. In the personalities of these great men, the dynamic and directive elements were also strong though the moral elements were the strongest. They sublimated their passions and transformed their dreams into realities. Their reason was well developed and mellowed and balanced by their feelings; they directed their ambitions not for personal gains but for the welfare and service of their fellowmen; they had a sense of humour. They were wise and courageous, they had faith in themselves, in men and in God; they were guided by moral principles and not merely by the material and intellectual values. The various constituents of personality were fully developed in them. Their personalities were balanced and well-integrated.

When the directive elements are strong, the intellectual strength is great and this itself gives a certain balance to the nature.

In George Bernard Shaw, the directive elements were the strongest and we know that he was famous for his intellectualism and 'Shavian' wit. The moral elements were also strong; the dynamic elements were above the average. Bernard Shaw achieved integration of his personality as a writer and thinker. The strength of the moral constituents of his personality made him effective in his field and enabled him sometimes even to win recognition as a man of action.

What is common, however, is that the passions and imagination are strong and their sublimation inadequate. This causes mental conflicts. While this very excess, by increasing the total strength of the personality, may sometimes make one a genius, he will find no happiness. Van Gogh expressed his genius through his paintings, but in other respects, his personality was unintegrated. He had fits of madness in the last years of his life and he killed himself in one of those fits (Nietzsche, who expounded the philosophy of the superman was, no doubt, a genius, but he became insane when he was fortyfive years old and never recovered until his death eleven years later). In the case of Tolstoy, passions and imagination were the strongest constituents of his personality, but the moral constituents were also very strong; the directive constituents were of average strength. Tolstoy was a genius of great dynamism and moral strength. But he was also subject to mental conflicts between his passions and moral qualities.

We may now sum up the development of the personality. Passions are the motive forces for the development of feelings, sentiments and the emotional life. Imagination provides the motive force for the development of ideas. It enables us to visualise the distant possibilities and inspires us to unravel the unknown and the mysterious. But passions may become tempestuous and violent and imagination may run riot indulging in sensual dreams. These forces may become dangerous to oneself and others if they are not controlled and directed by the intellect.

Chart depicting the personalities of some eminent men at the height of their fulfilment

	DYNAMIC CONSTITUENTS			DIRECTIVE CONSTITUENTS			MORAL CONSTITUENTS			Grand Total		
	Passion (16.65)	Imagination (16.65)	Total (33.3)	Reason (11.1)	Ambition (11.1)	Humour (11.1)	Total (33.3)	Wisdom (11.1)	Courage (11.1)		Faith (11.2)	
Abraham Lincoln (Statesman) (55)	18	20	38	14	13	14	41	15	15	15	45	124
Franklin D Roosevelt (Statesman) (60)	16	18	34	14	15	13	42	13	16	15	44	120
Van Gogh Artist (36)	28	24	52	9	9	6	24	7	14	11	32	108
Bernard Shaw (Writer) (60-70)	15	20	35	14	14	15	43	13	13	13	39	117
Leo Tolstoy (Writer) (60-70)	25	20	45	12	13	9	34	12	14	14	40	119
Einstein (Scientist) (50-60)	16	24	40	14	12	13	39	14	13	13	40	119
Swami Vivekananda (Religious Leader) (35)	20	20	40	14	13	12	39	14	14	14	42	121
Mahatma Gandhi (Great Humanitarian) (70)	18	18	36	13	13	15	41	15	16	17	48	125

The original table also contained a statistical analysis of the personality of Sri Jawaharlal Nehru. This has been taken out to avoid controversy with regard to a living personality. It is, however, the Editor's pleasure to record that the author's original ranking placed our Prime Minister the highest in the list of these luminaries, which includes Lincoln, FDR, Shaw, Tolstoy and Einstein. Sri Jawaharlal Nehru was ranked 28% above the normal genius! In this connection, the author's normal (100%) corresponds to the position of the highest achievement in a great man's life. The excess over 100 percent means that some are greater than the great.

Man is a rational being. He can control and direct his emotions and imagination towards ends determined by him. His reason flows along pathways which have been laid down by the process of education and conditioning of culture. He develops ambitions which he works out in the society in which he lives. He has to develop congenial relations with others and accept his failures in good spirit and maintain good humour if he is to be happy. Reason, ambition and humour constitute his intellectual equipment. If the intellect is strong, the emotions and imagination are controlled and directed towards rationally determined ends. A powerful intellect combined with strong emotions and imagination inspires great scientific or artistic achievements. Generally, however, in the case of a great artist, his emotions and imagination are stronger than his intellect and in the case of a great scientist the balance is in favour of the intellect. However both are intellectual and dynamic. But even where the intellect is strong, it may be used for destructive purposes—in discovering weapons and instruments for wars; or it may be employed exclusively for acquiring money, power and fame as does the excessively ambitious person.

So our inner life must also be developed. We have to have knowledge of the subjective world, that is knowledge of ourselves and other people as human beings and not only knowledge of the world of objects; we have to assimilate our experiences and integrate in our attitudes and views of life the emotional and intellectual sides of our nature. This is wisdom. Wisdom gives us calm, poise and self-control. But wisdom has to go into action to be effective. It is courage that gives us the power to progress from wise thoughts to hold speeches and actions. Physical courage gives one the power to brave difficulties, privations and dangers to the body, as for example the courage of a soldier on the battlefield; intellectual courage gives one the strength to uphold under all circum-

stances a line of thought or feeling, as the courage of an original thinker and writer like Sigmund Freud and moral courage invests one with the inner strength to live a dedicated life. Courage is sustained by faith—that is trust and confidence in oneself, in men and in God. While wisdom enables us to evolve our philosophies, faith gives us the conviction and inner strength to practise religion, to live our lives in accordance with moral principles and work and act to uphold our ideals. Wisdom may make one a philosopher or a scholar, but wisdom with courage and faith may make him a great leader of men and sometimes even a torch-bearer of culture and civilisation—a Christ, a Buddha, a Lincoln or a Gandhi.

In the cases of these highly evolved individuals, their passions were sublimated to become love, sentiments and finer feelings; their imaginations were transformed to become inspirations, visions and creative thoughts. Their personalities were therefore invested with dynamism. Their intellects enabled them to control and direct their energies towards self-determined ends. They were wise, courageous and inspired by faith. There were many in their days who were superior to Abraham Lincoln and Mahatma Gandhi intellectually, but they towered above them all by their moral stature. Their intellects in combination with their moral qualities made their total personalities immensely more powerful. They were inspired by a sense of mission and dedicated their lives for their countries and for humanity. So what characterises a superior individual is the development of an integrated personality by the sublimation of strong passions which is nature's gift to him of a large fund of vitality, the transformation of his dreams into realities, a powerful intellect controlling, guiding and directing his life efficiently and above all a moving spirit whispering wise counsel, sustaining courage and ever inspiring him to act with dedicated devotion in accordance with the truths dictated by his inner being.



Reorienting Leadership and Human Relations Programmes

Dennyson F Pereira*

An encouraging sign in recent times has been a felt need for conducting and organising leadership programmes. A few commendable attempts have been made particularly in imparting facts. However much remains to be done in the area of behavioural skills required for effective leadership. The new behaviour must be effectively maintained on the job or in the Community. This calls for complex training methods and practitioners drawn from established leaders in management, social psychology, social research and human relations, who could design a programme drawn from recent knowledge in the area of leadership and human relations. It also requires a keeping away of untrained persons and characters (who promise much and deliver little). As a result of supervisory and foreman training and management development programmes and projects and from other areas of social science research, group psychotherapy and experience of adult education there has been a considerable shift from the traditional didactic methods to the new techniques of Group Dynamics, emphasising the sharpening effect of feedback, involvement in decision making, interpersonal perception etc.

ALL OF THESE AREAS OF RESEARCH HAVE been merged into an integrated approach to leadership training now successfully worked out at the National Training Laboratories of Group Development, Washington. The goal of such an integrated programme is that the foreman, supervisor, youth or community leader will perform a more effective job of leading others, and relating with them than he has before, if he has the opportunity (a) to interact with others in a training group and to analyse the experience and gain insight into oneself and others (b) to gain an awareness of inadequacy and of the potentiality for improvement (c) to hypothesize about the consequences and effectiveness of new behaviour and to test out the hypotheses in practice (d) to practise new skills until security in their use is gained (e) to foresee back-home resistance to new behaviour and to plan and develop ways of overcoming such resistance and of

maintaining the new behaviour after it has been learned.

Briefly the above parts call for the following requirements for trainings : (a) creating experience-centred training groups in which the individuals and the group as a whole are collecting information about their own behaviour in relation to their goals, bringing the information as input to create changes in the manner and direction of output. (b) creating opportunities for the individual to test out hypotheses through role-playing. Action and interaction, analysis, hypothesizing, testing and practising are parts of the new effective programme.

Because much of leadership and membership in all areas of life, the workplace, the trade union, the social organisation and the home—takes place in groups; effective understanding of group processes and group methods are needed. These can only be learned through participation in group situations under training conditions and analysis of the group experiences. ●

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Qualifications for an Ideal Executive

TPS Suri

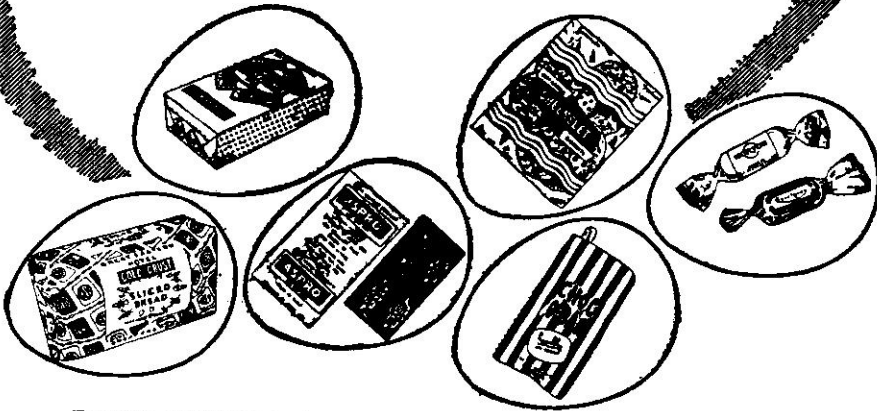
SOCIETY IS THE SOURCE OF AUTHORITY for any organisation particularly one producing goods and services for the welfare of the community. The executive has to so plan, organise and direct the functions of his concern as to maximise this welfare. He must therefore possess such attributes as would enable him to maximise the contribution of his concern to community welfare. Of course he must also have the qualifications necessary for the type of job he does, the level of management at which he functions and must above all be alive to the exigencies and dynamics of business. Some of these qualifications are inherent, while some are acquired and developed over time. However that may be, the most important quality required is a constructive imagination, able to visualise future events and see the business as a part of the stream of community life. It is only if the executive has this quality that he can participate intelligently in the decision-making processes that are the life blood of a business. To say that he should have sound logic and judgment, be straightforward, dependable, loyal and honest, that he should mean what he says, trust his subordinate, be confident of what he is doing, be balanced and have a good family life, with a smart clever and sociable wife, be well educated and all that: these are relatively commonplace attributes, though very essential for an executive; but as already said the most important quality is an understanding of the future in the context of developing technology, developing markets, social policies and the like. He must have an ability to question the present order, suggest constructive changes, place priorities and watch intelligently the trends in industry. If he is besides courteous and modest in behaviour, taller than his fellowmen, leads a balanced life and eats balanced food, has a good tone in his voice, social grace in his manners, it will certainly pay. These are additional desirable qualities. The most important social quality is that he must not only have but actually practise a code of morals in his managerial and business relations. He must not only be gentle abroad but also gentle at home in his business. This is the type of executive to which modern society is tending.



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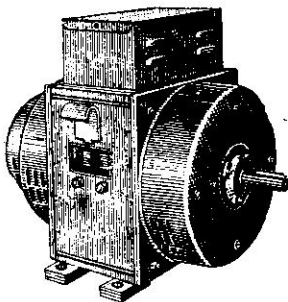
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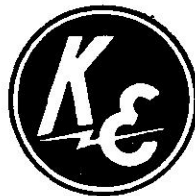
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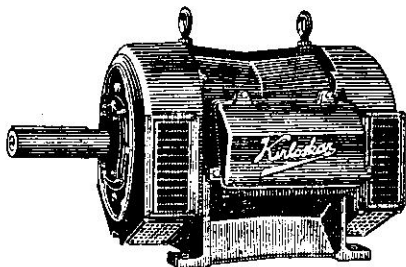
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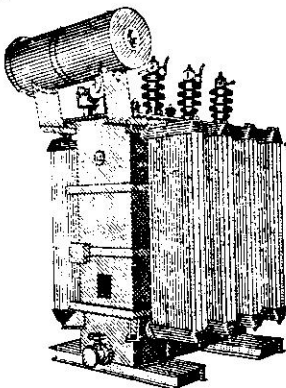


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Cost and Budgetary Control

PL Tandon*

Scientific Management does not involve a formalistic, highly complicated system of business management, but does include the process of investigation, analysis and decision. In this article I shall outline the salient features of Budgetary Control as we practise it in our organisation, which has been evolved with reasonable success by a process of trial and error over the past few years.

OUR BUDGET IS PREPARED WITH THE object of aiding management in planning, co-ordinating and controlling operations. It serves four main purposes:

- (a) provides us with a summarised picture of the results to be expected from the operations
- (b) following approval, it serves as a guide to executives and other departmental heads responsible for sectional activities
- (c) when followed up, it serves as a measure of performance
- (d) serves as an important tool of communication within the organisation.

Successful budgetary control cannot be achieved without full participation of all levels of management. To do this, management must possess a reasonable knowledge of the techniques and procedures of budgeting. This is achieved by encouraging management to participate in the preparation of budgets and by conducting formal courses in which the budgeting procedure can be explained to all concerned.

About five years ago, we decided that budgets should be prepared by our operating and service departments like Marketing, Technical, Personnel, Transport, Legal etc. The role of the accounts department

is to assist and provide necessary background information and not to prepare the budgets for others. Many of our non-accounting managers for the first time began to acquaint themselves with the preparation of budgets and so were able to understand the follow-up reports and appreciate the significance of variations as a guide to the progress of their activities. The formal courses conducted by our accounts department enabled them to get a clearer insight into how each division fits into the overall budget plans. This I would stress is more important than a well documented budget procedure whose value is usually hardly appreciated outside the financial groups. It is the practical training rather than the manuals that help management.

The sheet-anchor of our budgetary control is the preparation and follow-up of the annual estimate for the coming two years. This most important task of our senior management is a blueprint of our thinking and planning spelt out in detail and quantified in physical and monetary terms for the next year, and as a projection for the year after that.

The Annual Estimate covers the following major sections which are explained in detail later: 1. Sales and Margins 2. Overheads 3. Advertising 4. Capital employed and profit yields 5. Capital expenditure 6. Source and application of funds (cash flow).

* Chairman, Hindustan Lever Ltd., Bombay

The crystallising of pre-budget thinking is crucial. For example, before the finalisation of the Marketing plans, the specialist accountants examine the cost structure of each product, taking into account the changes in product formulation or packaging and its effects on contributory margin. They examine the product mix and offer suggestions to ensure the maximum gross contribution consistent with the broad marketing policy laid down. The alternatives of volume and margin mix are considered for each product till the best combination is chosen.

In giving a preliminary estimate of the overheads they take into account any changes in selling terms, coverage, distribution pattern etc. For example, if a Marketing Division plans to open a number of new accounts they are given an idea of its effect on the branch accounting costs. The number of invoices may go up, with attendant increase in the bills for collection, ledger entries etc. There should be a net advantage in a new proposal to offset the new costs. This we feel is a good method of control to ensure that no new proposal is considered by one section without a full knowledge of its cost to other sides of the business.

Our Marketing Divisions are also given an idea of the provisional yield on capital employed at this stage to enable them to decide on the adequacy or otherwise of their plans. Should the yield prove unsatisfactory, all the three sides of the equation viz. margin contribution, overhead expenses, and capital employed have to be re-examined to get a better overall result or to justify a new project.

Similar service is rendered to technical management in examining the profitability of new capital proposals and various factory overhead expenses.

A budget committee consisting of representatives from finance and one other department discuss in detail with the department concerned its budget estimates. This procedure ensures uniformity of approach.

This kind of positive role played by the finance and accounts department ensures that the estimates finally presented to the Board contain a balanced blend of all the activities of the organisation.

A special feature of our budgeting is the clear distinction made from the outset between variable and fixed expenses. Variables for this purpose include raw materials, packing materials, excise duty and distribution costs that vary strictly with production. The rest of the expenses are regarded as fixed expenses.

Marketing Divisions begin their thinking as early as May and on the basis of the broad targets given by them, all other departments prepare their plans. Sales plans indicate the quantity estimates for each product and the margin. Following the sales estimates, production estimates are planned and broken down over the four quarters, and then split among the various factories. From this Technical and Buying departments formulate their long-term thinking for the year ahead and beyond.

Marketing and Technical departments estimate their expense budgets bearing in mind the planned sales and production. The other service departments like Accounts, Buying, Legal, Personnel, Transport, estimate their expenses keeping in mind the long-term needs of the business. Short-term fluctuations in sales and production do not affect these departments to the same degree.

An interesting innovation is that in the overheads budgets we lay emphasis for control purposes on the number of people employed in each department, together with their grades. Individual managers do not control wages or salaries, as these are determined for the company as a whole by the Board and usually subject to agreement with the staff union. In fact salaries charged to departments are based on the averages for the various grades, and not on the specific salaries of individuals in the department. What any manager can influence is the number and quality of men he needs to discharge his responsibilities efficiently.

Organisation and Methods Department review the work of the various departments and suggest measures for improvements. Very often such a review takes place when a department asks for additional staff.

Another feature of our budgeting is to regard factory expenses, such as direct factory labour, repairs etc. as fixed cost in the short term and deal with them accordingly. *Our policy is not to throw out the surplus labour arising out of technological improvements and schemes like incentive payments but to carry them till they can be absorbed by normal expansion and development projects.* Thus control is not exercised by allocating labour costs over products, but by watching productivity for particular jobs in the factories, measured against work-study standards.

Recent American experience indicates that in several companies the wages of all employees are classified as period (fixed) cost because *it is a policy to maintain a steady labour force even though it may be necessary at times to assign production workers to make-shift jobs.*

Advertising is a policy cost determined partly by current sales objectives and partly by long-term requirements. This is prepared by Marketing Division and approved by the Board.

In the **Capital expenditure budget**, estimates are prepared by each unit and include expenditure for increase in production facilities, and provision for new projects. Expenditure on expansion and new projects is supported by a statement showing the capital to be employed, the profits to be expected and the return on the capital employed. Progress reports are given to Technical Management comparing the actuals with the estimate with necessary explanations for the variances. When actuals exceed the approved proposal, further sanction from the appropriate authority is required.

We have a Cash Budget, the purpose of which is to provide Management with a forecast of cash receipts and payments during the year and to ensure advance arrangements

for the adequate supply of working capital. Apart from forecasts covering the budget period we also prepare long-term cash forecasts to cover a five year period on a broad basis. These forecasts give early notice of when the need to augment financial resources may be expected, and so that the management may be prepared for it. This aspect of budgeting has not received the attention it deserves in most organisations.

Reporting: each manager gets the information he needs to measure his own performance and receives it soon enough to make it possible for him to make the necessary changes quickly. In reporting follow-up data we use a combination of oral communication, graphic media, and formal written statements. The reporting period varies from weekly to quarterly intervals depending on the nature of expenses under review and the requirements of the recipient. Until recently the only information supplied weekly was sales by quantity and margins based on replacement prices to Marketing and other management. We felt that the impact of the sales data would be more effective if we could indicate even approximately the trading results every week. This has proved to be a useful addition. Our sales week finishes on the Saturday and by the following Tuesday afternoon the Chairman has the week's trading results with him. There may be approximations which can be corrected later, but speed is the essential feature. Most of the overheads expenses are reported against the budgeted figures either quarterly or half-yearly.

It is the accountant's responsibility to do all he can to improve the means of communication. Very often carefully laid out reports are received by the supervisors explaining a number of variances, but they have only the vaguest idea of how to evaluate such information. We have found accounts courses specifically designed for a group very useful. For example, a course for marketing management may explain the significance of product mix on margins, importance of volume sales, profitability of sales area and territories, effective use of

working capital by controlling packed stocks levels and trade outstandings. A similar course for technical management would lay stress on the problems arising in the factory.

Cost Control: materials constitute our greatest individual item of expenditure and control is exercised at our factories. Standard of materials usage, yields and tolerances for wastages are agreed with technical management and during the year the actuals are reported and compared with the standards. To bring home the magnitude of the variances they are shown in money values to the technical management. Our experience with variances indicate that price variance is the single biggest factor, but we are not often able to exercise much control over it. Most of the raw materials we use are subject to wide fluctuations in price and alternatives are limited.

Technical Management are given weekly reports on labour and machine utilisation. *Our production programme is largely geared to*

marketing requirements and, as such, short-term fluctuations in labour or machine utilisation arise out of external factors over which factory management have no control.

To sum up, effective cost and budget control is exercised where

- (a) the system is tailored to suit the peculiar conditions in which a business is operating.
- (b) the human element is not forgotten by involving all management in the budgeting preparation and in a self-imposed control.
- (c) every effort is made to make the system understood by all concerned so that they appreciate its use to them in their jobs. The emphasis is on explaining rather than on written manuals.
- (d) the accounting management act as an integral part of the selling, production and purchasing team, always at their service to advise, guide and help.



Cost and Budgetary Procedures in India

PY Thatte*

For obvious historical reasons, not examined here for reasons of space, there has been a lopsided development of cost and budgetary procedures in India: while on the one side we see fully developed systems where highly advanced cost accounting and budgeting techniques are being used, there is the other side in which even the most rudimentary techniques are not in the offing. Against this background the author examines the development of cost and budgetary procedures in India with particular reference to the two well known broad categories: public sector undertakings, and industries in the private sector.

THE AREA AND SCOPE OF PUBLIC SECTOR undertakings measured in terms of the size of their turnover, labour and capital employed are expanding very rapidly; hence as guardians of the public interest, the local managements of these undertakings have to ensure that the men, materials and money are put to the best possible use. This envisages *development of controls* for comparing the actual results of each stage of manufacturing activity with the *targets set*, locating variations therein with causes and taking appropriate steps for their removal through budgetary and cost accounting procedures. In this matter the Public Sector is fortunate in having come to possess, more or less as a legacy from the Finance Department of the Government of India, a system of budgetary control for each of its undertakings: this, though good in its own way, cannot be said to be adequate for measurement of performance in industry.

The budgets one would come across in Public Sector undertakings are generally the following: (1) Capital Budget for one financial year (2) Revenue Budget per quarter (3) Ways & Means Budget (Cash

Forecast) per quarter (4) Production Budget per month.

The **capital budget** would normally include in the pre-development stage the construction of buildings, purchase and erection of machine tools and in the post-development stage, plant modernization equipment, replacement of old or obsolete machinery etc. The **revenue budget** formulated on the basis of the credit policy gives an estimation of the amounts likely to be received in each quarter and within it month by month from sales. The **ways and means budget (cash forecast)** highlights the position of liquid cash indicating the need, if any for raising short-term loans from banks etc. to tide over the financial stringency. The **production budget** works out the volume of goods to be manufactured on the basis of sales anticipation and availability of plant capacity.

For comparing the achievements against the goals thus set there is in every Public Sector undertaking a section or department whose function it is to report variances. This governmental system of budgetary control though inadequate for measuring industrial performance has been based on sound principles and as such would, with

*TISCO, Jamshedpur.

slight change, be an efficient instrument for controlling the manufacturing activities of the Public Sector industries.

By and large in the Public Sector industries (a) detailed costing procedures will be found to have been installed with emphasis on over-elaboration rather than on simplification with the result that in some of the industries there are as many individual overhead recovery rates as there are production shops in the works rather than having consolidated rates for shops having identical layout and machine tools etc. In fact, the outstanding features of the system are detailed bin and ledger accounts and material requisition slips for each individual item of stores, (b) prevalence of both individual and group incentive schemes for labour, (c) job cards etc. Some of these organisations have however introduced an integrated system cost and financial accounts, stopped separate costing of components, have begun to use accounting machines for tabulating stores issues, and are gradually developing standard cost and use of standard quantity and pricing system with variations charged to overheads. A few Government of India organisations have adopted the reporting by exception method, keeping down the number of monthly reports as far as practicable. Meetings of top and middle executives are arranged at periodic intervals. This is symptomatic of the need being appreciated for coordinating the activities of the various departments, and imbibing cost consciousness.

However, despite all that has been stated above the Public Sector industries have not so far been able to get away from the 'Cost-plus' basis for pricing their products.

The Private Sector industries present three widely different and distinct patterns of development of cost and budgetary procedures according to the classification of industries given below: (i) Competitive industries, (ii) Industries dependent on Government for fixing fair selling prices for their products, and (iii) Other industries. In industrial enterprises belonging to the first category, well-organised cost and

budgetary systems of a very high order will be found to be in operation. In the second type of organisation, attempts to develop costing procedures are being made mainly as a result of the pressure from Government, and reports of the Tariff and other Enquiry Commissions. In the third category of industries there is neither the cost nor the budgetary procedures.

In the competitive industries, the pace of development of cost and budgetary procedures has been very rapid, the development in each unit, however, being determined by its comparative size and the nature of the product turned out. The higher the competitive strength and sensitivity of demand to changes in tastes, the more advanced are the systems. Survival of these industries in the market is entirely dependent upon how accurate they are in forecasting consumer demand and the extent to which they are able to meet the same through their sales organisation by gearing up their manufacturing activities to achieve the output targets at minimum cost. They have, therefore, the most comprehensive cost accounting and/or budgetary procedures. The ultimate goal of all budgeting being the development of forecast balance-sheet and forecast profit and loss statement through operations planned in such a way as to secure maximum profit from a minimum investment in working and fixed capital, the scheme needs the fitting into it of the departmental budgets. In well organised concerns, each such budget is integrated into one unified whole, according to the principles of Cash Flow Planning. In such firms, the budgetary system with responsibility assigned alongside the organisation chart by precisely defining areas and accountability has been developed to an entirely built-in system of controls. This knits the organisation into one whole whereby providing the management not only with the entire operational picture at a glance but also a controlling lever. The modern trend in budgeting is towards dual controls, financial and quantitative and not merely on direct labour, direct material and direct expenses but more so on the evasive items of indirect labour, indirect material and indirect

expenses. Such a comprehensive budgetary system gives the necessary fillip to develop an equally competent integrated standard cost system under which the reporting of the volume and other variances from the pre-determined standards become easy. Here again the present day leanings are obviously towards a cost system which is capable of giving always in good time indications of trends in business.

On the top of the ladder of industries dependent on Government for development and price fixation, are India's no. 1 TISCO & IISCO (the iron and steel manufacturers for fixation of retention prices) with many industries down the rung, manufacturing a variety of products like rubber tyres and tubes, cement, trucks, bus chassis, paper etc. Regarding the cost accounting in the Automobile Industry the Chief Cost Accounts Officer to the Government of India has observed as under:

"Although the Tariff Commission in its 1956 Report recommended that the manufacturers should maintain cost data in sufficient detail (to enable the cost of production of components, individual assemblies and final assembly to be easily ascertained) the manufacturers have not appreciated the importance of costing and taken any steps to implement the Commission's recommendations." And this is what he has remarked in connection with the Paper Industry: "Although in a broad way the maintenance of cost data by the paper industry is not very much worse than the average pattern in the country we are of the opinion that the position is unsatisfactory: there is no uniform system of costing in the industry and although one of the units had data relating to standard cost and a few others had other kinds of basic data, all of them were found to be defective in one way or the other."

The only fault that one could find with the above remarks is that they are written with an eye on the maintenance of cost accountancy records in the conventional manner essential from the Commission's enquiry point of view which is rather outdated in that under it there would be no place for innovations like the keeping of only one stores control account in the main ledger as in the Automobile Division of Telco *vis-a-vis* the maintenance of detailed stores ledger for individual items of stores etc. yet it cannot be denied that the pattern of

cost accounting visible through the above observations made specifically about the Automobile and Paper Industries is not in any way different in other industries classified in this category but remains very much the same throughout but for a few old well established enterprises which have enlightened Managing Agency Houses to control their affairs.

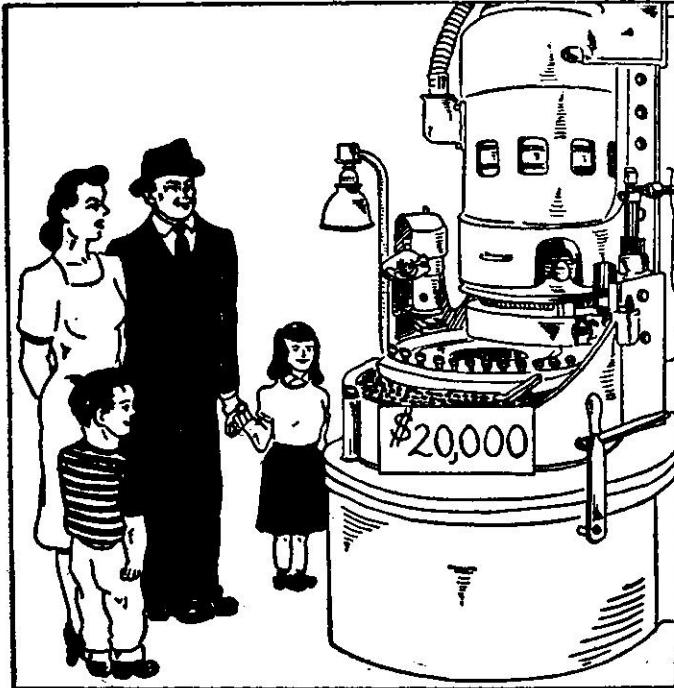
As cost accounting and budgetary control go hand in hand and each is dependent on the other for its full development it can very well be surmised that budgetary control procedures to supplement the cost data are very much scarce in these industries. By the statement we mean that there is little trace of modern cost and/or budgetary control procedures in these industries. Of course, they have a fairly good rough estimate of their costs; and so long as the overall cost of production is below the current ruling prices capable of giving them a fair return on the capital employed, they are satisfied. To this category belong some big companies, who could, if they desire, introduce upto date cost and/or budgetary procedures in their organisations. But the lack of instinct towards introduction of full scale cost and/or budgetary procedures is one of the striking features of a developing economy like that of our country which creates a seller's paradise. This explains the present attitude of industry towards cost and budgetary procedures, for cost accounting and budgetary control procedures have their full value when the law of 'survival of the fittest' comes into play in the economy of a country where competition decides the fate of industries. It is only at that juncture the need for maximum economy in the cost of production will become paramount and need of cost and budgetary control procedure will be felt and its aid sought for controlling it in all possible ways. But this does not obliterate the change that the manufacturers are not discharging in full measure their debt of gratitude to the society under which they are expected to make available to the consumers at large their products at rates cheaper enough to come within the reach of the economic means of the masses.

Conclusion

A great responsibility rests on the accountant in industry who has to sell the idea of costing and budgetary control procedures to his employer and to his fellow employees on the shop floor who have scant respect for cost figures that the budgets and cost figures are not accountants' babies,

but are the product of their activities clothed in terms of money. Fortunately the position is changing fast and it is to be hoped that the day is not far off when all our industries will become aggressively cost conscious, and install suitable cost and budgetary procedures in their organisations.

HOW FOREMEN CAN CONTROL COSTS



Few men realize that the machines some of them operate cost more than their homes with all their furniture.

Costing and Productivity

Anil Bannerjee*

An industrial undertaking today cannot be compared with that of the undertakings in the past, when life was much more spacious, there was plenty for everybody and human needs were few and simple. This, however, is past history now. Today, as in other fields of life, the increasing complexities of modern industrial enterprise have made the work of the management much more difficult than before. The phenomenal progress of industry, as we know it today, has been due to a stream of new developments in machines, processes and materials, in the face of growing competition and higher demand for consumer goods on the one hand and higher cost of labour, materials and machines on the other. Add to it the various governmental regulations, restrictions and directions, labour laws; taxes and excise duties; customs barriers etc., and you will get some idea of the present set-up under which industries have to operate. All this burden has to be borne by the industrial management today, who have to devise ways and means to keep the wheels of industry moving. *Progress is no more a matter of choice; it is a dire necessity for mere survival.*

WITH ALL ACCUMULATED BURDEN, MANAGEMENT had to search for ways and means to cope with the situation. In the course of this search, it was found that new machines and bigger factories; mechanisation and automation; division of labour and pre-fabrication, and other modern aids to higher productivity can be put to use for increasing output and reducing cost. But it was also discovered that the competitor can do the same and would probably outstrip the original innovator in the long run, if he has bigger resources. This made him *THINK*, which he had hardly done before. Formerly, he was content to have his financial account presented to him at the end of the year to find out the margin of profit and declare dividends. But now, he was faced with the problem of meeting his financial obligations at the end of the week and grave doubts about his ability to survive in business till the end of the month. It is at this stage, he felt the necessity of cost accounts to furnish him with cost information from day to day and week to week. It was also felt necessary

to have an efficient system of cost control which would ensure the success of his financial plans and budget.

Cost account is generally defined as a set of accounts for recording systematically and accurately equitable apportionment of the various heads of expenses incurred in the course of producing an individual item of merchandise in an industrial enterprise. The purpose of this detailed picture is to supply to the management an analytical view of the same transactions which are recorded in the financial accounts. Unless the manufacturer knows the true cost of his various products in detail, he would not be able to make the right decisions with regard to his sale, distribution and price policy; product development; material purchase and stocks, and various other matters of vital importance for efficient running of the undertaking. At the same time, for lack of details, he cannot direct his control apparatus to places where these are needed, viz. waste of material, coal, labour, machine-time etc.

*Costing & Efficiency Officer, Bata Shoe Co. Ltd., Batanagar.

The specific end to which all management activities are directed, is the end-product of

goods and services. The resources which go into making of the end-product, like land, buildings, raw materials, machines and manpower etc. are real things and have real cost. When these are used up in the process of manufacture and turned into finished goods, the value of the finished goods can also be measured in terms of money. Since higher productivity means more output from the same resources, it also means lower cost per unit of output. The work of the costing man is to furnish to the management, these relative figures from which the rate of productivity is ascertained; and this in turn determines the success or failure of the undertaking. But the true costing man should be something more than a mere recorder of figures. This will be evident from the following analysis of the main aspects of costing work.

Pre-costing or Standard Cost: by the word 'Standard Cost' is meant a predetermined cost structure of a product, related to a carefully planned method of making and selling. Cost standards cannot be set up without a planned technical process of operation and standardisation of methods. Generally the cost structure consists of the following elements: Prime cost covering direct material, direct labour and other direct expenses. Adding to prime cost, works overheads, administrative, supply and distribution costs, we get the total product cost.

Due to the vastness of modern industrial undertakings, consisting of a maze of assembly and sub-assembly lines; and a host of auxiliary and non-productive departments, it is not possible to make accurate costing of the products from a single point. For such big undertakings, it is necessary to establish different cost centres having a clearly defined areas for breaking up the total cost into smaller sub-divisions. Correct allocation of overhead expenses to the various cost-centres is a highly specialised job, and unless done with a great deal of thought and judgment, a condition may be created where the relation between the prime cost, the factory cost and the product cost can be completely distorted with the result that the management would be making completely wrong

decisions both in their operational and policy making capacity.

It is during the setting up of the 'Standard Cost' that the good costing man can make some vital contribution towards higher productivity. To do this successfully, he should know something of the nature of productivity itself. If the 'Standard Cost' which the costing man is going to set up is to serve as a yardstick for measuring management performance, that yardstick should represent a high level of efficiency. This however can only be achieved if the costing man is fully conversant with the management techniques of achieving efficiency. The broad outline of these techniques and their field of operation are as follows :

1. Product development : Market research
Product research
Pilot plant
Quality control and inspection
2. Specialisation : Work simplification
Standardisation
3. Process planning : Plant layout
Machine layout
4. Work study : Method study
Work measurement
5. Personnel policy : Attendance
Accident prevention
Training
Incentives
Welfare

The costing man, while preparing the cost-picture, must probe with a critical eye, into the working of the management techniques (given above) and ensure that the present picture of management efficiency according to the resources available is fully represented in his costings. He has to be particularly interested in the work study technique, which can considerably improve efficiency without any additional investment. Hence let us examine the technique of work study a little more closely.

Work Study is a term used to embrace the techniques of work-measurement and method-study which are employed to ensure the best possible use of human and material

resources in carrying out a specific activity. Generally, when working out the total work-content of a particular operation or a sequence of operations, it is found out that in each such activity, there are three elements, viz., Basic work-content, Excess work-content and Ineffective time. Basic work-content is the essential work required to be done in relation to a particular work to be performed. It is the irreducible minimum time required. Excess work-content is the work being done over the basic work-content. This may be due to (a) defects in designing and specification and (b) inefficient method of manufacture. Ineffective time is the time lost to production for which both the management and the worker are responsible. Management responsibility consists of making frequent changes in production, bad planning, bad machine condition and bad working conditions. Workers' responsibility consists of late coming, absenteeism, careless work and accidents.

Since the cost of the total work-content, including the excess work and ineffective time, enters into the final cost of the product; the costing man has to provide the management with an analysis of the total work-content. This would help the management to understand its own standard of performance and take steps in the right direction.

This very state of cost-consciousness makes all levels of management drive towards economy. Usually, the various heads of the line and service departments are so much immersed in their own technical and adminis-

trative problems, that they are apt to overlook the cost-factor frequently. Hence by a system of 'Cost Control' the position of actual cost in relation to the standard cost is made available to the management from day to day and week to week. The object of this exercise is to let the management know without delay any deviation from the standard cost, so that it can immediately direct its control apparatus to the spot, find out the cause of the divergence and take remedial measures. In most cases, it is found that the reason for these deviations is caused by bad workmanship, careless supervision, unstandard quality of material, defective machines, tools and equipment. Without such a system of 'Cost Control', management would be unable to locate quickly the spots where deviations from the standard of performance is taking place. This would allow the shortcoming to continue indefinitely without detection and would eventually cause the management considerable financial loss as well as loss of reputation.

It is often found that the costing man is made completely ineffective by the so-called technical men who try to cover up their inefficiency with a lot of forbidding technical vocabulary. This is a danger against which all costing men must guard themselves and the management should extend all possible support to them, in this respect. With a proper analytical and critical approach, any technical set-up can be appraised with regard to its true productivity and efficiency. The days of witch doctors are over. ● ●



That "bigger job" you're looking forward to will take even more knowledge of costs.

Optimum Borrowings for Maximum Capital Turnover

Chadda* & Saxena

The importance of the capital turnover rate (sales/capital) as an index of a firm's business efficiency is well recognised. The bearing of the mode of financing on this rate is also acknowledged in literature on this subject. However, precise studies in relation to trading firms in this respect appear negligible. A relationship between capital turnover rate and the mode of financing (borrowed/own capital) in the case of firms trading wholesale in cloth has been studied and an approach to determine the best possible ratio of borrowed to own capital yielding the maximum capital turnover rate has been outlined.

THE PRIMARY OBJECTIVE OF A BUSINESS enterprise is to secure a reasonable return on its capital investment.

$$\text{return on capital} = \frac{\text{profit}}{\text{capital investment}}$$

Return on capital is a product of two factors, profit margin (profit/sales) and capital turnover rate (sales/capital). In other words,

$$\text{return on capital} = \frac{\text{profit}}{\text{sales}} \times \frac{\text{sales}}{\text{capital}}$$

Normally, profit margin depends so largely on external factors such as competition, that management has not much control over it.

In the case of public sector enterprises, moreover, the price policy followed by some at least of them may be such as to leave little or no profit margin. But a business enterprise, whether it belongs to Government and is designed to subserve larger national interests or it belongs to private individuals and is run purely for profit, must be run efficiently; and there is no index of efficiency of management more significant or comprehensive than the capital turnover rate.

This rate depends on several factors. For example, the capital turnover rate is higher in trading than in manufacturing; within manufacturing, it is higher in light industries than in heavy industries. Other things being equal, it depends in an appreciable measure, on the mode of capital financing. A business may be financed either wholly with own capital or partly with own and partly with loan capital. As a general observation, it may be noted here that in the case of a firm having an abundant supply of own capital and not obliged to lean on loans, there may inevitably arise a sense of complacency leading to a low capital turnover rate. On the contrary, where own capital is meagre and borrowings heavy, the firm is under pressure not only to keep down its interest expenditure but also to maintain its credit. A challenge of credit vulnerability is pretty tough in a firm in which the ratio of borrowings to own capital is high. Since human effort varies in direct proportion to the toughness of the challenge, a high ratio of borrowings to own capital evokes greater effort, alertness and vigilance than a situation in which borrowings are insignificant and danger of losing credit equally little.

Secretary, Committee on Plan Project,
g Commission.

The influence of the mode of financing (the ratio of borrowed to own capital) on capital turnover rate is clear. The ratio of borrowed capital to own capital (α), it was noted during the study, could be distinctly related to the capital turnover rate (β) yielding useful results, which in fact are the main contents of this paper.

To examine any possible relationship between the ratios ' α ' and ' β ' it was considered advisable specifically to limit and define the business character of the firms to be studied. After a review of the attendant variables the best representative firms for the present study were noted to be trading firms, for in such firms the full spectrum of the impact of borrowings (in relation to own capital) on the capital turnover rate could be noticed by isolating it from other factors having a bearing on that rate. The nature of trade was also relevant and after careful preliminary survey of different principal trades, wholesale cloth firms were selected. From among these, with the closest identity of items dealt in, a group of firms was picked at random for further studies. For accounting periods ending between 1-4-59 and 31-3-60 the following data were extracted in respect of 36 firms:

a=own capital

b=borrowed capital

a+b=total capital

c=turnover

$$\frac{c}{a+b} = \frac{\text{turnover}}{\text{total capital}} = \text{capital turnover rate} = \beta$$

$$\frac{b}{a} = \frac{\text{borrowed}}{\text{own capital}}$$

From the data so compiled it was easy to determine the two ratios for all firms studied. Considering the two ratios, borrowed/own capital as x and the capital turnover rate as y, we arrived by the usual methods at the equation:

$$y = 2.585 + 5.11x - 1.245x^2 \quad \text{---(A)}$$

Maximising y by differentiating, we have
y max. = 7.828 at x = 2.05

Thus, for a borrowed/own capital ratio (α) of 2.05 (i.e., where borrowed capital

is about twice the own capital investment) we have the best capital turnover rate of 7.828. The graph (next page) plotted for the above equation (A) significantly stresses that for borrowed/own capital (ratio α) in the range of 1.25 to 2.50 the best capital turnover rates (7 or more) are exhibited. For a comparative study, the pattern of variation of y (values based on equation 'A') in relation to the variation of x in four steps from $0 < x \leq 1$ to $3 < x \leq 4$ is illustrated in the table below:

x	y
$0 < x \leq 1$	2.585 to 6.450
$1 < x \leq 2$	6.450 to 7.825
$2 < x \leq 3$	7.825 to 6.710
$3 < x \leq 4$	6.710 to 3.105

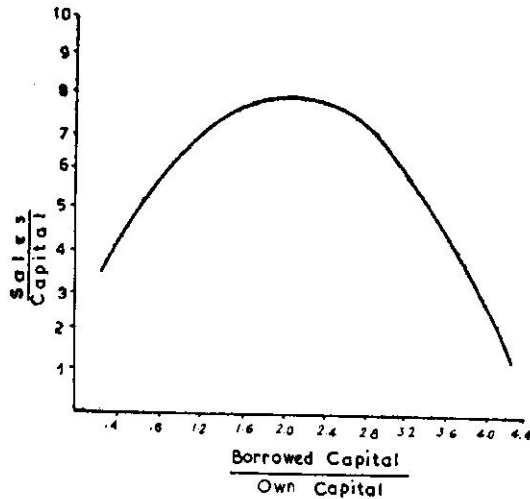
The maximum value of ratio ' α ' noticed in the firms studied was 4.32 but for a vast majority of them the value of ' α ' was ≤ 2 which is about the optimum given by the above equation. In fact 88.9% of the firms had the ratio ' α ' ≤ 2 , 5.5% had $2 < \alpha \leq 3$ and no firm had $3 < \alpha \leq 4$. The number of firms with the ratio between 4 and 4.32 (the maximum noticed) was only 5.5%. From the equation at (A) above it follows that for $y=0$, $x=4.556$. This, on a first look, may appear paradoxical since an asymptotic curve may be imagined as a more satisfactory representative of the situation. An asymptotic curve will envisage progressively increasing values of ' α ' (theoretically ' $\alpha \rightarrow \infty$ ') and decreasing values of ' β ' (theoretically $\beta \rightarrow 0$), but that is not so as the graph shows. The position represented by an asymptotic curve is not and can never be a practical situation in any trading firm. On the other hand, the existence of $y=0$ at $x=4.556$ is explicable in practical terms. Beyond a certain value of ' α ' the firm will be unable to raise any more borrowed capital. There is, therefore, a limit on the value of ' α '. As ' α ' reaches its limiting value, the firm reaches the end point of its credit vulnerability and the breaking point of its

trading activities. At the extreme point, y has necessarily to be 0 because at that point the firm will reach a stage where it will have to close down.

The above study and the discussion bring into bold relief the inherent distinct relationship between the two ratios i.e. capital turnover rate (β) and borrowed/own capital (α). It further establishes that the relationship is capable of a mathematical functional analysis which indicates a methodology for determining the quantum of optimum borrowings by a trading firm, yielding capital turnover rate. As related to the elaborate theories of a business firm, this result is capable of being fitted into the limited considerations and concept of a firm's efficiency, i.e., the most useful deployment of capital invested.

Such a concept, as noted earlier, is a very significant indicator for any firm.

That for a certain value of ' α ' the ratio ' β ' has a definite value is evident from the equation (A) as also the graph (below). But the fact that the capital turnover rate (β) starts declining after crossing the optimum stage corresponding to the value of approximately 2 of ' α ', merits more serious attention. This aspect may perhaps become more clear if similar equations for firms in other trades are evolved within the postulates of the present paper. Such studies are being made and it is hoped to present in subsequent communications a discussion of the possible causes for the exact relationship as existing between the two ratios.



There is no need for teaching complicated things. Simple improvements on a large scale, in principle accessible to all, could easily double incomes.

—Thomas Balogh in the *New Statesman*

Budgeting & Basic Functions of Management

Glenn A Welsch*

THE SUCCESS OR FAILURE OF A BUSINESS enterprise is measured, to a large degree, in terms of profits. The problem of keeping expenses below revenue is a never-ending one that increases in complexity as the size of the concern increases. Efficient conduct of operations involves on the part of management proper planning, effective coordination, and dynamic control. Modern management, in order to keep pace with the competition, must chart its course in advance, then utilise effective techniques to assure control and coordination of effort during the process of operating. Through this procedure, attainment of desirable goals previously set is most likely. It is on this basis that scientific management has come to recognize business budgeting as one of the more effective managerial tools or techniques that have been developed.

Budgeting as applied to business situations generally refers to budget planning and preparation, budgetary control, and related procedures. Budgeting is essentially a managerial process. A business budget is a plan covering all phases of operations for a definite period in the future. It is a formal expression of policies, plans, objectives, and goals laid down in advance by top management for the concern as a whole and for each

subdivision thereof. Thus there will be an overall budget for the concern composed of numerous sub-budgets in the form of departmental and division budgets, which in turn are generally broken down to smaller subdivisions consistent with organisational subdivisions. The budget expresses revenue goals in the sales budget and expense limitations in the expense budgets that must be attained in order to realise the desired net income objective. In addition, the budget expresses plans relative to such items as inventory levels, capital additions, cash requirements, financing, production plans, purchasing plans, labour requirements, and so forth. The budget is a formal statement of management plans and policies for a given period to be used as a guide or blueprint in that period.

Budgetary control involves the use of budgets and budgetary reports throughout the period to coordinate, evaluate, and control day-to-day operations in accordance with the goals specified by the budget. The mere preparation of a budget may prove to be of considerable value to the average concern, but its maximum value lies in the planning aspects and its utilisation for coordination and control purposes during the period. Budgetary control involves a constant checking and evaluation of actual results compared with budget goals, which should result in corrective action where indicated.

*Professor of Accounting, University of Texas, USA.



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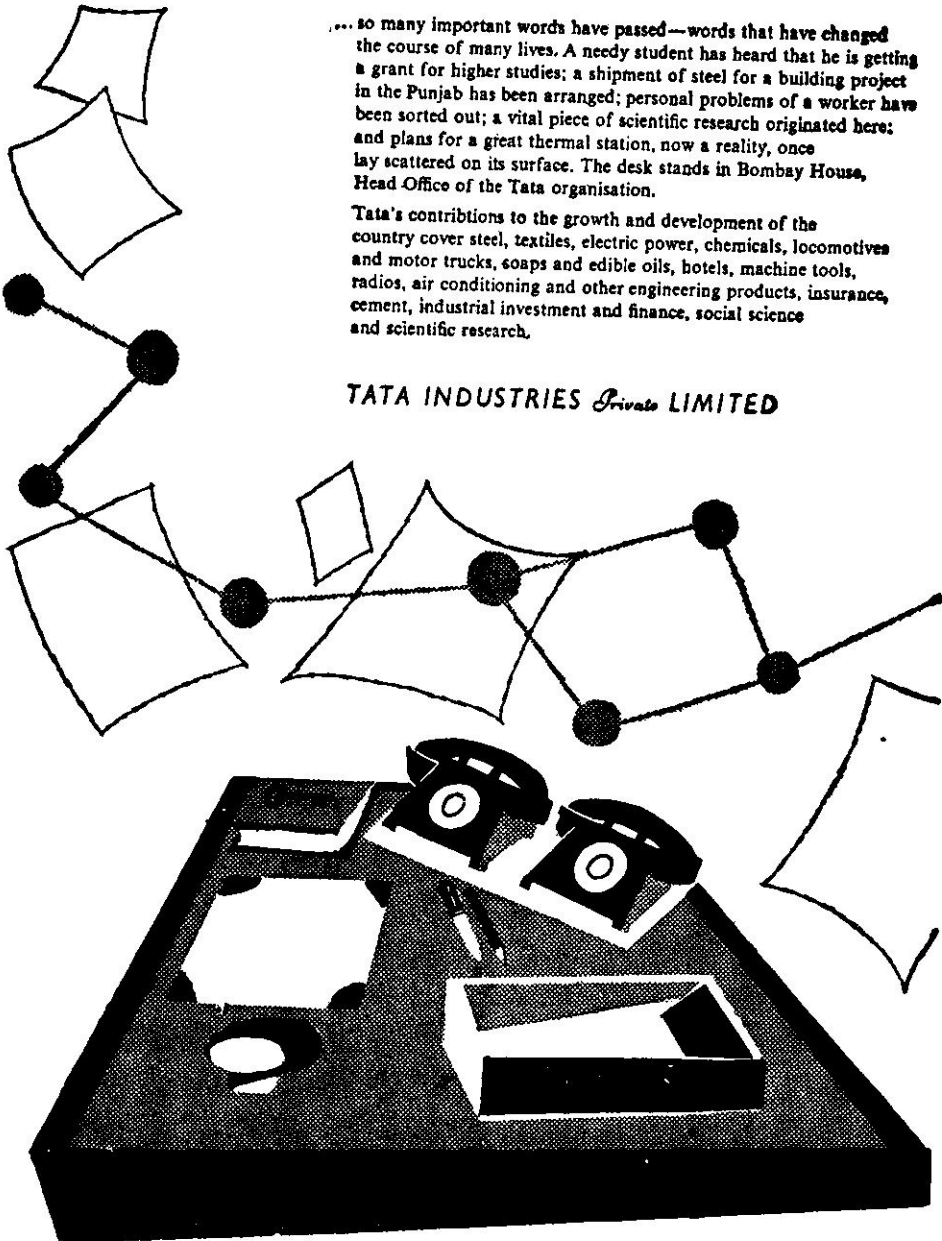
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Budgetary Control

JN Bose

A budget is an intelligently prepared estimate of future business conditions. It is principally designed to assist management in the coordination of the production, distribution and administrative functions of a business. Budgetary control system is the term applied to a carefully worked out plan covering the coordination of all of these functions, as well as a continuous study and comparison of the actual operating figures with the budgeted figures. It is therefore an instrument of control, as it can be used by management in determining the amount of the deviations from plans and the possible causes of these deviations as well as fixing responsibilities for the same. It is a *method of rationalisation* whereby estimates covering different periods of time, are, by study of statistical records and analytical researches of all kinds, established for all and everything affecting the life of an organisation, which it is possible to express in monetary terms. Budgetary Control is a management technique aimed at ensuring (a) optimum profitability of a concern through effective control of income and expenditure, and (b) liquidity and stability of the business. The essential feature of budgetary control is that it enables an objective to be established from consideration of the probable course of events. In this context it is regrettable to find that with the exception of some big manufacturing units, few businesses in this country, whether in the public or in the private sector, practise the modern techniques of budgetary control, while the author found in the course of his visit to several big and medium-sized industries in the UK that practically every organisation is managed under systematic budgetary control with consequent optimisation of efficiency. On the other hand our firms are at the mercy of circumstances and chances and hardly any management is in a position to foretell the results of its activities. It is just commonsense that against the pressure of modern circumstances, all activities should be preplanned in quantitative and monetary terms and actual achievements compared with the plan.

BUDGETARY CONTROL ENABLES THE executive to think and think as a group. It is really applicable not only to industrial concerns of all types and sizes, but also to commercial organisations, river valley projects, transport services, wholesale and retail businesses, power plants etc. In the changing economic structure of our country, regular and methodical budgetary control will yield results in terms of productivity that would really be extraordinary.

We may now come down to brass tacks and examine step by step, how industrial budgeting is actually done, taking the example of a famous heavy electrical industry in the United Kingdom of which the author

has experience. The first step is the budgeting of sales of each product, followed by a production and cost budget and an operating budget, separately for materials, labour, overheads, capital investment etc. Then comes the profit and loss account, and the last but not the least is the major consideration whether the required capital is available. This leads to the formulation of financial or cash budget.

As regards the period of budgeting it naturally depends: a heavy engineering industry may prepare its basic budget for five years broken up into three-year or two-year periods, annual budgets, half year budgets and so on, to be reviewed from time to time. Depending upon the state

trade, a firm may prepare a quarterly budget, taking into account current trade, seasonal fluctuations, present plant capacity etc. In this connection we may emphasise what is called the flexible budget. It excludes the fixed charges in respect of marketing, administration and production, and takes into consideration only the variable and semi-variable items such as direct labour, power,

shop stores etc. which vary with the load. These are items over which the management can exercise effective control in the short period. Last but not the least, the most important part of budgetary control is what we may call *evaluation of performance for industrial productivity is nothing but the optimum level of performance that can be achieved with existing resources.*



HOW FOREMEN CAN CONTROL COSTS



You have three kinds of costs to control and reduce—material, labor, and overhead.

Aims of Budgetary Control

James MS Risk*

A. Planning & Policy Formation

1. To assist management at all levels to plan and control the income and expense of running a business so that it may produce at the best possible rate of output and with maximum economy.
2. To provide figures to guide management in making sound decisions on contemplated policy or changes in present operating methods.

B. Budgeting of Operating Costs, Product Cost, & Profit etc.

3. To establish what should be the most economical cost of each function or activity in a business.
4. To establish what should be the cost of the products under defined internal conditions and based on careful forecasts about future external conditions.
5. To establish what should be the profit or loss of the business over a defined future period.
6. To establish the additional plant and machinery etc. needed (including replacements) to achieve the budgeted output and sales; and to prepare a statement of budgeted expenditure for such plant.
7. To establish the amount of cash needed (and when required) to finance capital and revenue expenditure to achieve the budgeted level of activity.

C. Analysis & Interpretation of Variances

8. To analyse the difference between expected profit and actual profit and to show the causes of such difference.
9. By showing differences between budgets and actual expense or output (or sales) to indicate weaknesses needing investigations; also improvements which should be maintained.

D. Control by Management

10. To link the control of output and cost with individual responsibility and authority; so that there is some person responsible for each item of expense.
11. To provide each level of management with prompt and regular information indicating where action is needed.

*Chairman of the Education Committee of the *Institut of Cost & Works Accountants of Great Britain.*

12. To separate those adverse factors which can be eliminated or reduced by action, from those which are caused by external factors beyond the Management's control.

TEAM Installation and operation can conveniently be considered under the letters of the word 'Team', because the installation and operation of budgetary control is essentially based on teamwork.

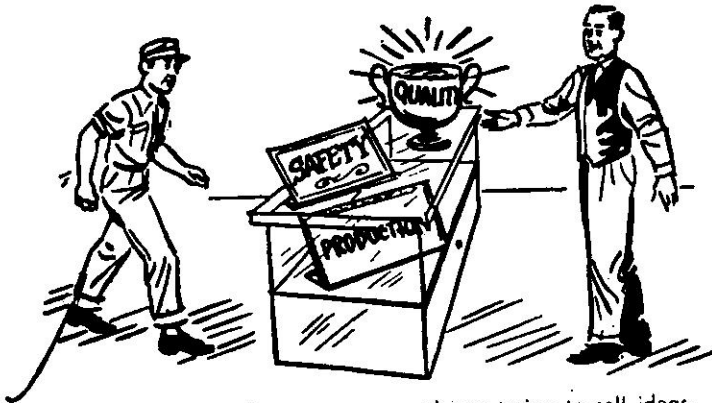
T stands for Technique and implies the process of adapting the general theory of budgetary control to the technical conditions of a given business.

E stands for the Education, in a broad sense, of everyone concerned with the installation and use of budgetary control. Provision of explanations, instructions and guidance.

A stands for Action. Budgets and standards are of great use in forming policy, and in checking the profitability of products. They also have very great merit as tools of management for cost control and cost reduction.

M stands for the Mechanics of operating the system. This is the sphere of the accountant's department. Quick and accurate short-term accounts are needed.

HOW FOREMEN CAN CONTROL COSTS



Supervisors are salesmen—you are always trying to sell ideas.

The Mechanics of Budgetary Control

AK Sen Gupta*

Though this article is concerned with the mechanics of budgetary control, the making of a business budget essentially means making a choice among the various alternatives on the basis of the probably working of the market and physical and cash resources in hand and likely to be acquired. Budgetary Control means executive action to guide and regulate the sources of business. According to the management's reading of the probable course of functions, it implies a constant watchfulness on all phases of activity. Some may be watched daily, others weekly, monthly, quarterly or even yearly. Budgetary Control is essentially a technique of management which plans and coordinates all the functions of the business towards the objective of maximum profitability and exercises control to ensure that actual business operations do conform as closely as possible to the plans.

BUDGETS MAY BE PREPARED FUNCTIONALLY according to the requirements of production, sales, distribution and administration; or departmentally on the basis of centres or production shops; also according to the nature of the cost as for example capital expenditure etc. Budgetary Control begins with recording of performances, preparation and presentation of control data, and ends with exercising control by taking corrective actions.

The chronological sequence of business budgeting begins appropriately with a Sales Conference of marketing specialists, business economists, others who considering the increase in population, custom or preferences, past sales trend etc. forecast what the volume of sales is likely to be for the products of the particular business, or other products which could within certain limits be manufactured by the concern. This sales budget is translated into a production budget and further into a purchasing budget for materials required, things that might be secured from other suppliers, packing materials

etc. Then the sales department calculates the advertisement and other expenses necessary to sell the budgeted volume and the accountants prepare the cash budgets for the purchasing and other regular disbursements like wages must be regularly financed. For this the inflow of cash from the market, credit arrangements with suppliers and banks have to be worked out. This however is only budgeting. Budgetary control begins thereafter, for a watch has to be kept on sales, their promotion in zones whose offtake is falling below budget; reports on production, purchase, plant utilisation, packing materials variance have to be obtained and a watch kept on labour efficiency. Above all an inventory control is a part of the budgetary control for the purchasing department must ensure a sufficient flow of materials to the shop floor. At the same time too much money has not to be locked up in inventory control and advantage has also to be taken of seasonal availabilities, bulk purchasing etc. Then a number of control indices have to be worked out regularly showing gross profit, net profit returns on capital and business policies adjusted to the dynamics of the new situations as they emerge.

*Cost Accountant, The Britannia Biscuit Co., Calcutta.

Principles of Budgetary Cost Control

A Gopalakrishnan*

For every kind of management, irrespective of the nature of activity, budgeting serves two distinct and cardinal functions: planning and control. A budget is designed to ensure that the events or performances are in conformity with the plan adopted. It is expressed in financial terms just because other criteria are not always effective or universal. It is, however, possible to express productive efficiency in man-hours, rejection percentages etc. In fact, these criteria are also adopted wherever necessary. The nature of the budget depends to a great extent on the key factors involved in planning and control; hence budgetary control is really not the sole domain of the accountant, embracing as it does, the activities of the entire organisation, the financial language being only a convenient vehicle for expressing the objectives of the enterprise and for comparing the activities of its various functions.

THE PRINCIPLES OF BUDGETARY CONTROL constitute not only a method or system of accounting but in a more significant sense, a method and technique of management; hence the criteria or key factors adopted should be effective indicators of activity, efficiency and quality; and should be for that, relevant, crucial and capable of accurate measurement. The key factors would, of course, depend on the nature of the activity and the limiting factors encountered in that activity. For example, in a chemical process which is a continuous operation, the key factor is the continuity of the process alone; and the whole concern has to be so organised as to ensure continuously that the process loss percentage does not exceed a certain maximum. In a rolling or wire drawing mill, machine-time is the key factor and idle machine-time has to be kept to the very minimum. In case of power shortage again it is the production obtained per unit of power which becomes the crucial factor.

The second important principle of budgetary control is the identification or responsibility with the connected point of authority. If materials are purchased only on requisitions approved by the Works Manager, the Store

Keeper should not be held responsible for excess storing of materials. It is, therefore, necessary to make a very close scrutiny of the organisational set-up and to formulate a pattern of responsibility accounting which fits with the authority delegation at various points. This, however, is more easily said than done, for in organisations having staff or advisory relations, specialised staff advice influences decisions to a great extent. In such cases it is difficult to locate the point where control and corrective action should start. Secondly, there are many examples of pyramidal organisation, where authority is only said to be delegated but in fact there is reluctance in letting down the substance of authority. These practices really misuse a system of budgetary control making those below the authority level, scapegoats for their own faults and shortcomings. The system in such cases is used as an aid to excuses for what could not be done; the corrective action in such cases should start with a re-orientation of attitudes at the top managerial level.

Account has also to be taken of the outside limiting factors such as awards of tribunals or price fixation by Government. There are also such internal limiting factors as the minimum maintenance of machines. These expenses cannot be reduced though it may be possible to utilize the machines more fully and effectively. In such cases the scope for control lies on the production side. If, however, demand is the limiting factor, then it is on the sales side that action needs to be taken. We have situations of an intermediate type, where increased production would lead to lower costs and on the sale side, reduced price may mean increased sales. Here coordinated action by production and sales staff would yield results. Each element of activity should be subjected to close and critical analysis. This would reveal areas of profitable control. It is this aspect of budgetary control that gives it its dynamic cha-

*Indian Aluminium Co. Ltd.

racter. From time to time the form of the control system with its varied reports and statements goes on changing, assimilating new factors and budgetary elements, as new areas of control are discovered, and shedding from it, those factors, reports etc., which might have served their purpose, but may no longer be required for the system. For example, in a certain works where railway was the only system of transport, and freight rates were beyond the control of the works, this was not an area to which any attention was paid. In course of time, as road communications came up, the same practice continued with the result that transport costs went up; it was later found that it was uneconomical to send or get certain goods by road. In any case, it was essential to negotiate the rates with the road carriers to get the best terms. In another case where contract labour was used for materials handling a certain close watch had to be kept on it when mechanical handling equipment was installed, such attention to economy in handling was not called for. Whenever it is found that new factors or criteria of control are introduced, the next step would be to fix targets and standards for such criteria, assimilating them into the master budget. Only this way, can a budgetary control system be kept upto date and lively facilitating close and effective control.

Control, just like planning, is always *forward-looking*, and should be more concerned with what is likely to happen, and what could be done to make events as far as possible conform to plans, than what has happened, why and how. The latter information is useful only in so far as (1) it furnishes an analysis of the past events, showing the effects of various factors and forces, from which (2) it indicates the likely trend of future events and (3) shows what type of corrective action is required to influence future events to the desired aim or goal. Exactly, these are the main functions which any budgetary control system should perform. For this purpose, reporting system should be as prompt as possible, lest time should be lost in finding any deviation and its cause. Secondly, it

should reveal trends, and one should not be content with showing the results for the current period viz. month, week, or day. It is in this context, that the "Z" charts, showing graphically, in one place, any control information for the period, the cumulative of the year, and the average for the previous 12 months, or 52 weeks, are most useful. The indication of any trend is most useful in projecting and forecasting future events, thereby giving a basis for the control action. Thirdly, the system should indicate the point or spot which action should be aimed at. For this purpose, a brief analytical review of any control report should help. For example, when the inventory value of spares increases beyond expectation, the review should indicate that at the point of approving requisitions for purchase of spares, control should be exercised, and it is this activity, that should be subjected to a more rigorous check. If this does not reduce the inventory to the expected extent, the control should be directed still further to an earlier point in the procurement of spares—may be in this case, a review of the necessity for various types of spares, and deciding as to which items should be stocked. In this manner, by spotting out the point to which any corrective action should be directed, the control system prepares management to an attitude of farsightedness, and anticipation, always searching for the root cause of variations or shortfalls from targets, so that correction could be more effective and permanent, than it should otherwise be.

The above four points are not the same as the process of control, which consists of (1) determination of standards of performance (2) formulation of plans and targets, (3) measurement and appraisal of performance and (4) initiation of corrective action. They embody certain guiding principles which make a scheme of cost control with the aid of budgets more effective and successful. It is not claimed that these are the only points which deserve attention, but they are found to be positively important and helpful to the success of a scheme of cost control.

This article is being published in a more detailed form in the Cost and Works Accountants Journal.

Technique of Budgetary Control

HN Sitharamiah*

THE TECHNIQUE OF BUDGETARY CONTROL really lies in identifying the key-factor that governs the budget of a particular concern. This key-factor differs from industry to industry and from time to time and possibly from concern to concern. A well-informed management, aware of its resources in all their significant detail, is conscious of the key-factor that controls its costs and profits. It is however the general circumstances that have to be understood in the first instance: the environment within which the concern functions, for under competitive conditions, possible sales volume is the key-factor; if it is a seller's market, production capacity becomes the key-factor. Sometimes availability of raw materials, sometimes skilled labour are the key-factors. For some trades it is the availability of working capital that determines the quantum of profits that can be made. In India today we have several key-factors probably in the following order: availability of equipment, raw materials and skilled labour. These are the limiting factors to the quantum of goods that can be produced for sale.

The second important point about cost and budgetary control is that this technique has possibilities of application only if the organisation structure is in itself ready for its operation with precise departmental and sectional responsibilities and a pervasive cost consciousness. Secondly this technique of cost and budgetary control can only be operated under conditions of standardisation: the products to be manufactured, the methods of production, even the sources of supply,

must be standardised in the professional sense. The rest of the procedure is mechanical: a budget committee well informed with regard to previous performances, the possible level of activity, actively in touch with all departments, with all the up and down lines of communication in good order.

The best characteristic of an industrial budget is its realism, or what may be translated as resilience, with capacity of adjustment to changing conditions. It must be based on a level of performance that is reasonably attainable and has been agreed on, in fact prepared with the concurrence of various executives, with the overall pattern of budgetary control more or less in accordance with the organisation chart; and the whole system so organised that actual results are promptly reported, divergencies examined and corrective action immediately taken. Whether a number of budgets should be framed would of course depend on the size and type of the concern, such for example, as a budget for production costs, selling and distribution costs, personnel budget, a purchasing budget, a budget for research and development, above all a capital expenditure budget and a cash budget. Under all these budgets a variety of alternates is possible and should be fully explored, for example, instead of purchasing additional machinery, the management may think of developing sub-contractors. Then there must be detailed sectional budgets, accounting for all the materials consumed, labour used, and taking their share of overhead costs.

The most important problem of management is to give authority to those capable of exercising it, thereby avoiding unnecessary

*Cost Accounts Officer, Radio & Electricals Mfg. Co. Ltd., Bangalore.

burden of detail, yet retaining control by devoting its major attention to the important function of direction etc. Usually top management becomes burried in detail because they cannot decentralise authority for want

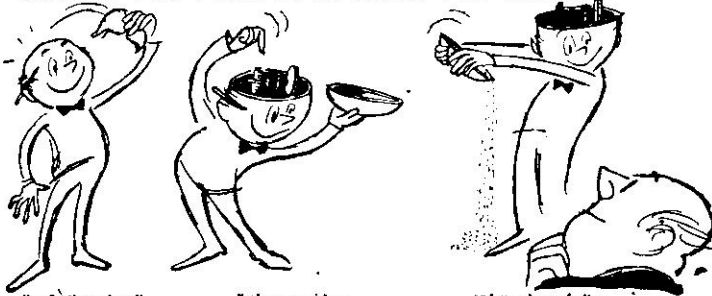
of a system of control. Budgetary Control technique provides the necessary procedures and data for such delegation of authority which incidentally builds up leadership so urgently required in India.

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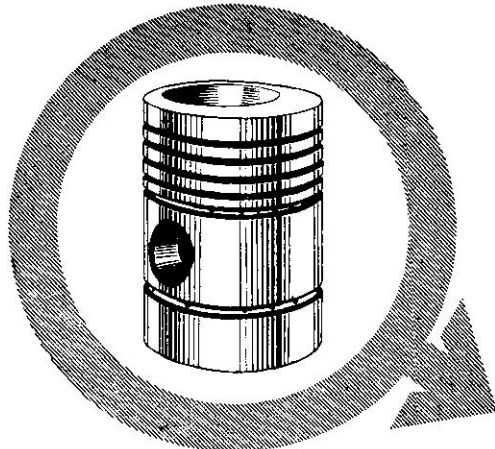
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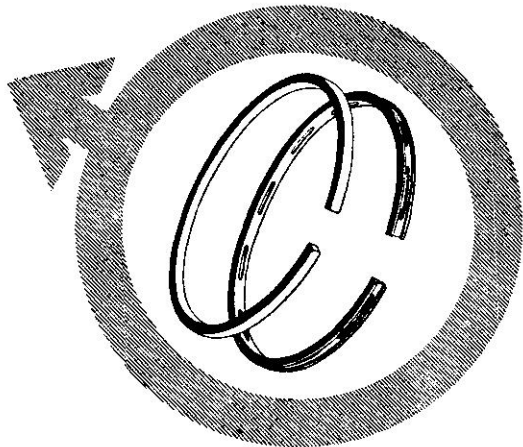
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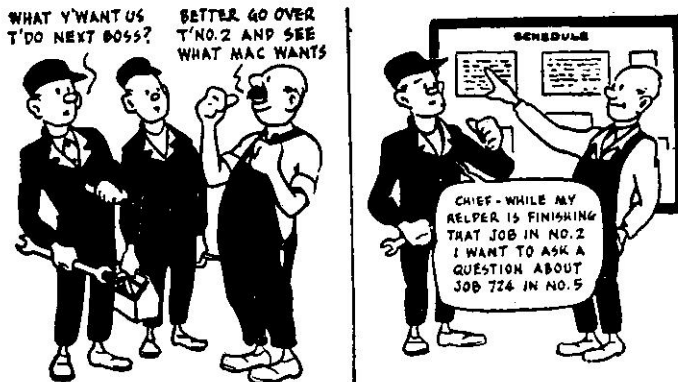
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Dynamic Budgeting

Glenn A Welsch*

DYNAMIC BUDGETING IS THE PRINCIPAL TOOL OF planning and control offered to management by the accounting function; its usefulness increases with the complexity of the organisation. It also is the accountant's open door to the inner councils of top management. This mutual enrichment of function between management and accounting is a vital feature in the successful life of progressive enterprises, but its full potential frequently is hindered by the gap between the mechanics of budgeting and their practical application to the problems of modern management. In developing the principal components of a comprehensive budget programme, emphasis has necessarily to be placed on how such a programme can significantly aid management in accomplishing its basic functions of planning, coordination, and control. Principal techniques of budgeting have general application to most business situation. These techniques, in current and effective use by progressive concerns, have in the first instances to be understood as general concepts and then applied in sufficient detail to permit adaptation to the particular management problems in large and small manufacturing and trading concerns. A budget programme must be tailor-made to fit each particular situation; accordingly it would be inadvisable for any one enterprise to apply all of the techniques of cost and budgetary control whose exposition is found in the textbooks.

* Professor of Accounting, University of Texas, USA.



Cash Flow & the Secret of Growth

FJ Muth*

WITH A VIEW TO DOUBLING OUR BUSINESS during the present decade, let's take a practical look at the possibility of a 50 percent increase in sales over the next five years. Whether or not we succeed in accomplishing the ten-year goal will depend largely on how soundly we plan today. The financial manager knows that a large increase in sales volume cannot be accomplished without an increase in capital. Additional funds will be needed to underwrite increased operating expenses, increased accounts receivable and increased inventories. If we are to reap the full benefits of the opportunities of the next decade, we must set up our financial programmes today or risk the possibility of constructing the potential growth in sales and profits through lack of funds.

Let's begin with a quick review of the fundamentals of cash flow. The first cash that flows through a business is usually supplied by the owners. A second source is provided by individual lenders or banks. This cash finds its way into fixed assets, i.e., land, buildings, and equipment, and into working capital to finance accounts receivable and to establish inventories. At this point we learn of another source of cash, as our vendors in extending credit on the purchase of inventories are, in effect, lending money, for they are providing goods which will be paid for later. If our businesses are to be profitable, the inventories must be sold at a price that is greater than the cost of the goods themselves plus operating expenses. Most of the cash which flows through a wholesale business is generated by this sale of goods. Cash sales represent an immediate return of funds. Sales on account return cash after some delay. When we sell at a profit, we not only are able to replace the original inventories, but we add to our cash supply. This increased cash supply makes it possible for our businesses to grow since it enables us to service increased quantities of inventories and higher levels of accounts receivable.

Another source of cash, in a limited sense, is the depreciation charge normally reported as a part of operating expense. This charge recognises that fixed assets are gradually exhausted through use, and that it is necessary to set aside a cash reserve for their replacement. Whereas most operating expenses must be met immediately, the replacement of fixed assets can be delayed until such time as considered desirable by management. In the interim,† the portion of cash resulting from sales which represents the depreciation charge is available for use as working capital.

*Controller, Armstrong Cork Company.

†The interim, however, is only the interim. Over a period, the secret of growth lies in a sustained, surplus cash inflow, to finance developments as they come along, invest in new assets and new products, cushion market fluctuations and hundreds of other inevitabilities of modern industrial life.

Manufacturing Budget

TP Chatterjee *

Budgeting is a statement of financial plan for the whole organisation, which aims at formulation of business policies and company objectives through intelligent planning and forecasting of future operations and achieving them through a well-balanced programme of action. It is principally forward-looking and indicates a formal expression of business goals in financial terms. Through budgeting forecasted plans are formalized into action by the coordinated activities of all operating executives.

THE BASIC THOUGHT IN BUDGETING IS how to achieve top-management objectives reflected in the budget plan by following a planned course of action and through development of financial and cost consciousness among all levels of management by creating their interest in formulation, implementation and execution of the plan. Budgeting is a management function as it covers all phases of business operations of functional executives, such as, selling, production, finance, administration etc. It calls for enthusiastic participation of all levels of management into the planning function and their coordinated and cooperative action in achievement of such goals. Basic plans and objectives are formulated by top-management and these are achieved through lower management by working out the details of the programmes of action. To make these objectives and plans realistic and conform to general company policy, adjustments may be necessary, both upwards and downwards, to come to a final decision.

In order to obtain the best results from industrial budgeting, forecasting is essential. This requires a close study of general business trends, a close watch of the general economic indicators such as the national income and outlay, population, employment trends,

seasonal and cyclic fluctuation, study of market conditions, product development, Government's policies, regulations attitude etc. All these have to be studied with particular reference to the company business trend and growth in the context of the particular industry of which the concern forms a part. All these have to be studied with a view to adjustment of the plans and policies of the concern for which the budget is being framed. The actual budgeting of course involves the forecasting of sales, sale prices, planning products and product lines, coordination of sales estimates, production budget, profit objectives, forecasting of capital expenditure, preparation of cash budget etc.

Effective industrial budget, however, presumes a sound organisation with procedures and plans and personnel attuned to maximum and resilient utilization of resources, adequate accounting of past operations etc. It, however, needs to be stressed that budgeting has to be a continuous process and expenditure has to be controlled at the origin. Besides, there must be a system of appraising performances to get the best out of industrial budgeting. It can also be argued the other way that budgeting itself helps to develop a sound organisational structure and to bring about an economic utilisation of resources and a clear formulation of company plans and policies.

*Park Davis (India) Ltd., Bombay.

As regards the budget period there is no hard or fast rule. It all depends on the nature and character of the organisation and of the industry, of the type of market to which it caters. The budget, however, should distinguish between short-term and long-term objectives and take note of fluctuations over a period of time. The period of budgeting is adjusted with regard to requirements, situation etc. Sometimes a budget

is related to a complete production phase; after all a budget is only a means to an end. It is an instrument for guidance of management. It cannot dominate the organisation itself. Used as an instrument supported by efficient planning and a certain decisiveness in adjustment to changes in conditions and circumstances as they arise, it constitutes a productivity technique of great potential.



The incentive plan is unfair when employees take all the gains customers the losses.

Preliminaries of an Output Budget

BEFORE PREPARING THE OUTLINE OF THE GENERAL PRODUCTION BUDGET it is almost essential to have some data as to the relative incidence of the various cost items, the main headings being, of course, material, labour, and overheads. This should be available from previous records with varying degrees of suitability, analysis, and accuracy.

The basic figures can usually be abstracted from previous Profit and Loss Accounts, adjusted if necessary.

Figures may be taken for the business as a whole, or they may be available departmentally. If possible, they should be analysed somewhat as follows—

Materials (detail if necessary).

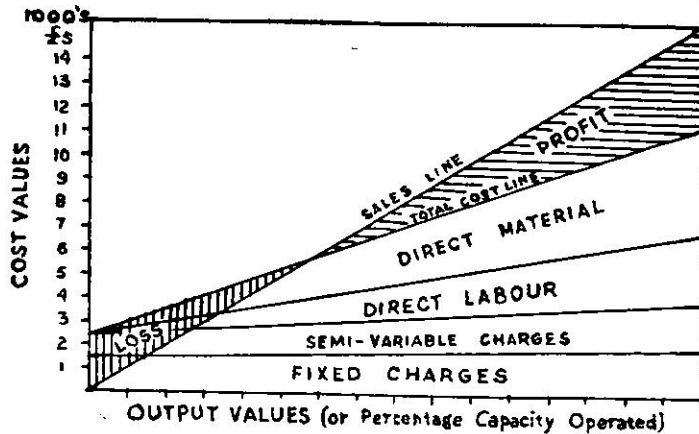
Direct Labour (detail if necessary).

Directly Variable Charges (Sundry Indirect Supplies, etc.)

Semi-variable Charges (Indirect Labour and Materials, etc.)

Fixed Charges (Rent, Rates, Depreciation, etc.)

Percentages		
To Output	To Direct Labour	To Total Cost



This analysis should be made over a wide series of years and at various values of output.

It may prove very useful to plot the figures on a chart showing the experience of cost incidence at varying volumes of output, but allowances will have to be made for changes of conditions and methods.

Even if suitable previous records are not available it will still be advisable to try to make up a graph on these lines for future conditions. Such a graph may not show budget expense details for departments, but it will prove exceedingly useful for checking up budget figures and ensuring that all figures are kept in proper relation to one another and that expense trends are kept in line with output values.

Flexible Budget—a tool of cost control

AV Srinivasan Murthy*

The problem of effective cost control is continuously taxing the brains of Management. Budget, being the predetermined extent of expenditure, guides the executives by providing the outlines and limitations of their costs. Thus, it is a compass to ensure a smooth and directed flow of business. The analysis of deviations from the budget throws light on the causes of variations and educates management in both spending and forecasting the course of events. An intelligent budgeting also ensures minimum costs by fixing the targets for maximum outputs with the minimum possible inputs.

WHEN ONE SPEAKS OF A BUDGET, ONE has in mind a fixed quota of output per month or per year and a constant expenditure. In other words, one speaks of a Fixed Budget. Many manufacturers in India are well aware of the advantages of Budgetary Control. But, perhaps, for a great number, Flexible Budget is a new idea. It is the manufacturer who benefits the most from a Flexible Budget; for in a majority of industries, fluctuation in production is inevitable, as managements are forced to vary production either to meet changing demands or comply with the supply of inputs and financial resources. It is not simple arithmetic to calculate what would be the cost for 9,000 or 11,000 units when 10,000 units cost a certain amount; for there are certain fixed costs, which do not vary with the volume of production; certain other costs which are fixed in relation to the volume of production, only within a certain range of activities and they suddenly go up or down when production falls below or goes above the particular range. Variable costs

on the other hand vary directly and proportionately with the value of production. Even this is not always true. At higher levels of production, the inputs like raw materials, power, etc., become cheaper due to bulk purchases. There are also certain other costs which are partly fixed and partly variable.

Under uncertain and fluctuating conditions a fixed budget (a pegged cost and volume) is however unreliable and a linear arithmetical manipulation leads to serious miscalculations. It is here that a Flexible Budget becomes particularly useful. It sets targets of costs for different slabs of Production taking all differing conditions into consideration at each stage. It is not intended in this paper to enter into the complexities of the preparation of a Flexible Budget. However, it would not be out of place to mention that differential costs for each next slab may be included in the Flexible Budget statement to make the instrument more effective. With this perfectly reliable knowledge of costs at each slab of production and the differential costs between two slabs, costs of fluctuating production can be efficiently controlled.

*Divisional Accounts Officer, Southern Railway, Hubli.

A Rare Case in Administrative Costs

KG Belbeck*

ONE OF THE PROBLEMS IN BUSINESS IS THAT YOU CAN rarely find identical businesses to compare with each other. One of the commonest phrases in business is, "Oh, we are different". However, occasionally an opportunity occurs when a valid comparison can be made, such as the following.

During World War II, a purchasing commission set up a number of small manufacturing operations throughout the US and Canada. The commission supplied the machinery, which was uniform from plant to plant. Each establishment was of the same size and was allocated identical quantities to produce. In effect, these organisations were as alike in basic composition as peas in a pod... a really unique situation. After some time, the purchasing commission analysed and compared the costs of each of these operations and found a rather wide variation in the total per unit costs from one plant to another. They decided to investigate. They went first to the higher cost operations and did not find too much to complain about. Indeed, these operations had very low overhead costs. The investigators then visited the plants with the lower per unit costs. To the commission's surprise, they found very heavy administrative costs in these plants that were consistently the lowest unit cost producers. The point was, of course, that these units had overhead staff working on very rewarding projects... how to increase the productivity of direct labour, how to reduce tool mortality, how to schedule the last ounce of production through the facility and so on. The outcome was that the results more than paid for the cost of their efforts.

From this, we can draw a fairly solid conclusion: High administrative costs do not necessarily mean high unit costs. As a corollary to this, we can add: The secret to success in this regard is to make certain that our administrative services really make a useful contribution. This is the nub of the question on administrative costs: Not are we paying too much but rather are we getting sufficient value in return?

*Stevenson and Kellogg Limited, Management Consultants, Toronto, Ontario, Canada.



"Are you part of the problem or part of solution"

Cutting Paperwork Costs

Robert A Shiff*

IF TOP MANAGEMENT DOES NOT HAVE CONCRETE COST DATA, the dollar leaks begin to spread. The experience of a large mid-western chemical company is a case in point. Several years ago, the firm found its record-keeping programme in a state of near chaos. It had never bothered to develop a sound authorization policy to control the cost of paperwork, and the economies it did practise turned out to be false ones. Records were kept in ice houses, basements, closets, stairwells, and wooden crates, because these facilities were "available". An inventory of the firm's paperwork disclosed 80 million pieces of paper in office file cabinets and an equal amount in dead storage. In one drawer, auditors found some rocks with the notation: "Rocks thrown through the window during the strike of 1887".

Was it any wonder, then, that the company did not know the cost of its paperwork? With the aid of a records management specialist, the firm established a pilot programme in its office. Records were analysed on the basis of their legal requirements, the frequency with which they were used, and their function. Obsolete records were junked, and age-limits were set for all other paperwork.

When the company reviewed the operation of this test programme four years later, it found that it had saved almost a quarter of a million dollars. This successful operation led to the adoption of the same records retention and disposal system on a company wide basis. The firm announced a saving of more than \$150,000 in one single year through the release of space and filing cabinets.

*President, Naremc Services, Inc.

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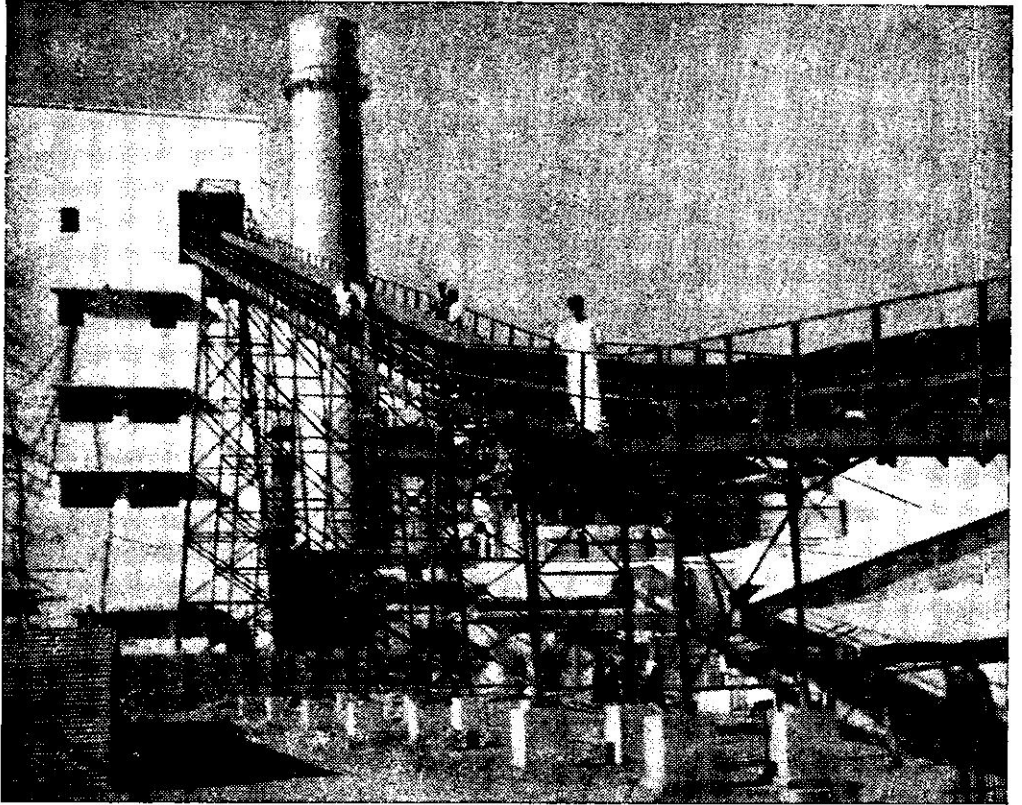
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Cost Accounting & Productivity

During the summer of 1950, the Technical Assistance Group of the Organisation for European Economic Cooperation (now the OECD) were considering the place of Industrial Accountancy in relation to Production, and on their recommendation it was decided to send a Technical Assistance Mission to the USA to study the service which American accountants give to industry and the use which industry makes of that service. This Mission No. 50 was not the first team to study industrial accountancy in the USA under ECA auspices. Reference had been made in several reports, particularly in that of the French Electrical Manufacturing Industry Mission, to the connection between cost accounting and productivity. A national team from the UK had visited America in May and June 1950 and produced an excellent report under the title of "Management Accounting" which was having a good reception in Britain. A French Mission composed of accountants in professional practice also visited America in April and May 1951 to study accounting as an instrument for measuring and increasing productivity, but its field covered all accounting techniques and the study of cost accounting was only one part of its programme. The Mission responsible for the Report summarised below was, however, very different from either of these national Missions. In all, thirty-four men from eleven countries—Belgium, Denmark, France, Greece, Holland, Ireland, Luxembourg, Norway, Sweden, Turkey and the United Kingdom—took part. The interests of the members were varied; there were professors of business methods, economics and accounting; engineers; men from Government services and public utilities; practising accountants and business consultants; and a strong representation from the finance and accounting sides of industry and commerce.

THE CONCLUSIONS OF THE MISSION ARE that: generally, there is high productivity in America and some of the principal factors causing this are (a) the natural wealth of the country (b) the large home market provided by America itself (c) extensive specialisation and standardisation made possible by the large market (d) the belief that the right to increased profits is through an increase in production and a decrease in cost and that this is supported in America by free competition (e) the conviction of American labour that high productivity is essential to provide and preserve their own high standard of living (f) the extent of investment in capital equipment (g) the organisation and efficiency of management.

organisation of management

The organisation of management has benefited from (a) the delegation of authority and responsibility. This has been facilitated

by the use of budgets, which are accepted as internal contracts which must be honoured (b) the effecting understanding and use of Line and Staff Management, with an insistence on good relations and teamwork between Staff Departments and Line Management (c) the work of the Controller and his Department who are responsible not only for the speedy compilation of cost figures and statistics but for their appreciation and presentation to management (d) the use of budgets for planning and controlling operations and development in the medium and long term.

cost accounting practices

American management itself is satisfied that one of the sources of its own efficiency is the full use it makes of cost accounting (ii) Cost accounting systems and practices have been evolved with the primary purpose of cost control; the ascertainment of unit product cost is of secondary importance (iii)

For cost control purposes there is an increasing use of scientifically set standards and standard costs (iv) Standards are regularly used in cost systems which do not themselves comprise a full system of standard costs (v) Standards are regularly used in cost practices of industries of all types, whether engaged in repetitive processes or not, and in small as well as large companies (vi) The use of budgets as a means of managerial control is becoming universally accepted (vii) Great importance is attached to accurate and scientific budgeting and many companies find it advantageous to have a small staff of specialists engaged in this work.

reporting to management

In reporting to management *speed is regarded as of more importance than complete accuracy*: (a) In reporting to the different levels of management, the terms most suitable to the particular level of management are adopted, e.g. at the important level of foremen, cost information may be expressed in units of time or material rather than money (b) Special investigations into aspects of costs not covered by routine cost reports are regarded as of considerable value.

training for management

American industry recognises the need for training in management as a subject and has evolved a close working relationship with the universities, through their schools of business administration, which assures that the necessary teaching is provided (ii) Cost accounting, with particular reference to the use of standards and budgets, is recognised as a necessary part of the study of management (iii) The American societies connected

with accounting have succeeded in interesting a wide audience in the advantages of accounting systems to secure cost control.

The main differences between cost accounting in America and Europe lie not in the accounting techniques but in the purpose for which cost accounting is used, the extent to which standards and budgets are used and the widespread demand of management for cost accounting services to meet its need.

The recommendations of the Mission are that in Europe: (1) the essential is that business and industrial management shall understand the potentialities of modern cost practices. (2) The use of cost systems and practices for the purposes of managerial control should be encouraged. (3) Technical management and industrial accountants should realise that the successful practice of cost control requires the closest cooperation between them. (4) The conception of controllership should be encouraged. (5) The practice of using standards and budgets to facilitate the delegation of authority and responsibility should be encouraged. (6) Universities providing facilities for commercial degrees should establish the closest liaison with local business and industrial communities and should encourage training in general management as well as in the technical functions of management. (7) Individual managements should assess whether the expense of introducing and operating modern cost accounting practices would be worthwhile in their own particular circumstances. (8) National Associations of Employers and Accountants should be invited to take the lead in advancing knowledge of the value to industry of modern cost accounting methods.

"My mind is made up. Do not confuse me with facts"

Control over Manufacturing Costs

Jagmohan Singh*

For any manufacturing organization to stand internal or external competition it is not only essential for it to know what it exactly costs to manufacture any product but also to keep the manufacturing cost under systematic and strict control. It is an aspect of business which has to be continuously approached with severity and seriousness. Continuous cost control programme in good time as well as bad is better than cyclic outbursts of cost cutting in bad times.

THE ESSENTIAL ELEMENT IN COST CONTROL IS *proper organization and a good system to effect this function. "Systems, however, in themselves do not Control"*. Most managements take it for granted that a new system of Control in itself is going to solve all problems. Solutions can be derived from systems only after employing enthusiastic administration and intelligent interpretation. While adopting any system the management has not only to see that it meets the outlined objective of providing adequate measures but have also to see the economics of employing it.

In our country where the cost per worker is quite low if a fair day's work is achieved and the other resources are utilised to full extent. There is no reason for not being in a position to compete the entire manufacturing world in cost area, especially in the plants which have been recently installed with upto date equipment.

Effective control of other costs such as Selling, Distribution, and Administrative Work etc. play an equally important part in pricing the end product but *in this paper only "Manufacturing Cost" is being considered*. There are six main factors that influence manufacturing cost. By keeping tabs on these factors, managements can know the trends of performance and accordingly take

necessary corrective action quick enough to arrest the cost at the rising stage before it gets too high.

the factors

- **direct labour cost** based on the productiveness of the manual effort involved.
- **direct material cost** depending on the purchase price of the raw material, also the yield from it.
- **indirect costs** tied up with plant maintenance, materials handling, paper work, house-keeping, quality control, service utilities (water, gas & power etc), general supervision effort involved and labour fringe costs.
- **rework costs** due to items getting lost, obsolete or scrapped on account of being of sub-standard quality.
- **added operations** relating to design change or additional features added to the product.
- **ineffective time** production: time lost due to various reasons, poor supervision etc.

In order, therefore, to keep the manufacturing cost at the minimum level it would entail building up suitable yardsticks for constantly measuring the actual expenditure under each factor and systematically controlling the variances noticed. The supervisors and the

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executives responsible for particular effort must regularly be appraised of the results of these measurements and be answerable in accordance with specific responsibility. This will not only inculcate general cost-mindedness but also will develop an attitude of vigilance at all levels of the organization.

It is not necessary that measurements be all in money values for instituting effective control. In fact, as converting the time consumed into rupees is delaying effort, the control on the utilisation of productive time in certain cases is better performed in time values from day to day performance results.

● **direct labour effort** can be measured on the basis of actual man-hours expended for particular output against the hours required for that output from the established operational standards. The comparison that can be carried out on daily basis gives the utilisation index of available manpower. The information is timely enough for the supervisors to take effective action, when it can do most good.

● **material cost** can be controlled by comparing the actual quantity of material utilised and its cost for particular output against the bill of material specifying the quantity required after allowing for necessary processing waste for the same output at standard purchase price.

● Useful measure for **indirect cost** is comparison of actual expenditure against the systematically developed budgets for each cost head.

● **cost involved for re-work** requires particular attention as theoretically it should not be there at all. Such a condition, however, does not exist in practice. The measure, therefore, is the allowable tolerance established for this factor.

● The measure for the cost due to **added operations** is the budget for the particular output.

● Measure for **ineffective time** is percentage of productive time lost for a unit or group of men or machines during day's performance. Control action will depend on

the extent of deviation from the standard established tolerance.

A suitable check that can be installed for providing the facts for ascertaining the percentage of time being expended by a unit or group of men or machines under particular pre-determined activity is the "Activity Analysis Study" carried out at frequent intervals. This study will give the performance index and can be measured against established standards. Excessive variances under any activity will be the signal for adequate action.

The plant supervision as well as the top management require to know the results of the periodic performances, and for that reason it is essential to furnish the different levels of management with suitably constituted reports at frequent intervals. These reports *must be quick and simple enough* to help the responsible individuals to know how the costs are going in order to arrest them at the proper stage. The form, content and frequency of reports should be in accordance with the needs of different levels of management.

Basic requirement under commercial manufacture is to be able to produce a good standard quality product at minimum possible cost. Prosperity or freedom from competition always tend to add fat to the expenditure but careful planning and good system of Control can nip the roots of this tendency.

The essential elements of any Control system are, setting of targets, comparing of actual with the targets, investigating the fall downs and application of prompt corrective action. Under good Cost Control therefore, people responsible for particular activity must take timely action on getting the indication when actual results are compared with the results that should have been accomplished.

Instituting effective control is purely management's responsibility and causes of failure can only be attributed to short-sighted policies, lack of understanding of the techniques involved or lack of enthusiastic co-ordinated effort on the part of its executives. ●

Management Accounting and Cost Control

W E Harrison

COST CONTROL IS DEFINED AS "THE guidance and regulation by executive action of the costs of operating an undertaking". When one sets out to guide and regulate anything, be it motor car, aeroplane or business, it is necessary to have a plan, or course of action, clearly defined. This plan must have a satisfactory termination,—a town or airport at which to arrive, or in the case of a business, a satisfactory Trading and Profit & Loss Account and Balance Sheet at the year end. This envisages the compilation of Budgets for the business, clearly setting down what it is proposed to do during the budget period,—normally, one year, although both shorter and longer periods are used for special exercises. The compilation of Budgets in a large business is complex, but not a difficult operation: in a small business it is relatively easy; in all businesses it is very rewarding!

A budget is defined as "A financial and/or quantitative statement, prepared prior to a defined period of time, of a policy to be pursued during that period for the purpose of attaining a given objective." It can be seen therefore that the act of budgeting necessitates the clear definition of a policy to be pursued, which in itself is a vast improvement upon the "hoping for the best" attitude of many backward business managements.

It is not possible, within the scope of this article to deal in detail with the various budgets which are compiled, but two points

may be emphasised: (a) the various budgets must be co-ordinated to achieve a balanced business, so that at the end of the year a satisfactory profit will be obtained, and, equally important, a satisfactory Balance Sheet will also be presented (b) the various budgets will be used during the budget period, for purposes of control, in order to achieve the objective defined in the budget.

At the earliest possible stage therefore it is necessary that management should clearly define the policy to be pursued, and should also define and delegate authority in a clear manner. Every manager, at all levels, should know exactly the scope of his authority and responsibility. Once this is accepted, it is not difficult for the management accountant to sit down with each manager (in logical order) and jointly they can agree the amount which should be spent on each type of expense, under stated conditions.

It is a fundamental truth that a man can be held responsible only for those items of cost which he can control by his own (or his subordinate's) actions: it appears logical therefore that a manager's budget should include only those items within his control. Once this is accepted, it is not difficult to *divide the whole of the probable expenditure of a business according to responsibility*. The so-called fixed expenses of a business,—those expenses which have been incurred by top management as a matter of policy to run the business for a year,—are the responsibility of the Managing Director.

As contrasted with these expenses, the truly variable expenses of a particular department or cost centre are the responsibility of, and should be controlled by the manager or foreman in charge of that department or cost centre. This necessitates the clear definition of responsibility, which in itself is a good thing.

In between these two extremes there are other items of cost which are less easy to regulate and control, but, without exception, someone within the organization is responsible for them. In the early stages of budgeting and budgetary control these items will give rise to arguments and troubles, but if all problems are tackled in a realistic manner, responsibility can be fixed. Ultimately all budgets will be agreed, and each one will be accepted by the individual manager whose working it is to assist to control.

Whilst all budgets are co-ordinated, and assembled into a composite whole, the results of which are shown in the Trading and Profit & Loss Account and Balance Sheet Budgets, those budgets which are set to control the variable costs of the business are capable of being flexed in order to indicate the costs which should be incurred at the level of activity actually attained. The flexing must be in accordance with the activity attained in each department or cost centre,—not for the business in total. Thus whilst a business may be extremely active, certain departments may be working below budgeted capacity, and consequently the budgets for these departments must be flexed to the level of activity attained by each department respectively.

It must be clearly stated that those *budgets do not control costs; they only define an accepted plan*. It is consequently necessary to collect cost (and other) information, period by period, to see whether the plan is being carried out. If we are not working to plan, we wish to know why this is so, and also what the results of the divergencies are likely to be.

The management accounting organisation consequently must ascertain, each period,

two pieces of information: (i) the detailed costs of each type of expense incurred by and in respect of each cost centre, and (ii) the amount of production, or effective work turned out by each cost centre, in terms of the most suitable unit or units of measurement.

The collection of the detailed costs period by period, within the classifications laid down in the accounting system is relatively easy, but in practice the ascertainment of "work done" in terms of the most appropriate units of measurement frequently presents problems. This arises because an attempt is made to measure the production or output of a department, instead of the "cost centre". A simple example may illustrate this point. If a large engineering business has its own foundry department, it is not sufficient to consider the foundry as one department for purposes of control, and no single unit will measure in a realistic manner the production of the foundry. The foundry must be divided into cost centres, and different units used to measure the effective production of each cost centre. Thus metal costs will be measured against the weight of good castings produced; melting costs will be measured against the weight of metal charged; core-making costs will be measured against standard coremaking hours for the work produced, and moulding costs will be measured against standard moulding hours produced. We thus have four separate "units of measurement", but each one enables us to compare what has actually been done with what was planned to be done when our budgets were compiled, both as regards volume and efficiency.

Assuming that a business has a sound policy, which, as revealed by the summary budgets results in a satisfactory net profit, then the actual net profit achieved depends upon three things: (a) the profitability of products (b) the efficiency of departments or cost centres (c) volume.

Consideration of the profitability of products is outside the scope of this paper, but it should always be remembered that various

products have vastly differing profitabilities, or profit potential. Management must always be in a position to assess the relative profitability of various products, and this is best done by consideration of the standard marginal costs and standard selling prices of these products. From these, management should always be aware of the contribution per unit of the limiting factor, or of any potential limiting factor in respect of every standard product. It can be seen that profitability is determined at the time standard costs and standard selling prices are fixed. "Profitability" is unchanged by changes in efficiency or volume: "profits" are affected by changes in profitability, efficiency and volume.

Cost control is effected by management action, in respect of the efficiency of departments or cost centres, and in respect of volume. The action to be taken depends upon both the type of variance, and the scope for action; the latter is important, since *the most desirable action is not always possible*.

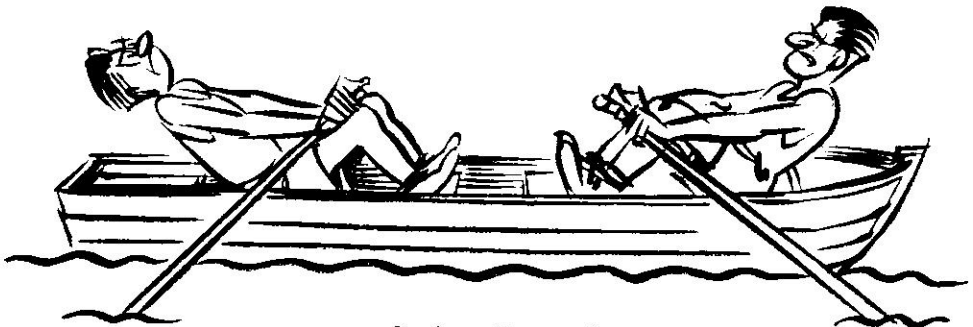
At the lower levels of management, the provision of the actual costs of a cost centre, compared with the standard costs in respect of the activity actually attained, and the analysis of variances according to their cause,—price, quantity, efficiency, etc., enables each manager to see where and why he has departed from the plan which he assisted to compile, and the action which he takes to correct adverse trends, should be, and usually is, followed by action to prevent a recurrence of such inefficiencies.

Where the standards are improved upon,—and this sometimes happens, top management should be very interested. Here is something which was better than expected, and the cause of this improvement is worthy of consideration to see if it can be maintained.

The fixed expenses budget (or budgets) of the business enables a comparison of these actual and budget figures to be made, and variances revealed. These variances show that, as regards these items of expenditure, management has not done what it intended to do, and the important question to ask here is "why?"

The final consideration is volume. The information collected in the management accounting system shows that the volume of work done, or of sales differs from that indicated in the budget. In some sections of the business actual effective work done may be more than anticipated, in others it may be less. The management accountants' figures show these differences, and management is able to control by action, either to increase production or to reduce expenditure in order to attain the objective defined in the budget.

The operation of cost control can be summarised in the following sequence: a) definition of the objective. b) allocation of responsibility. c) collection of information. d) analysis of the reasons for variances. e) action. The control depends entirely upon the action ultimately taken, and the effectiveness of the control depends upon management ability, supported by adequate information supplied by the management accounting system.



Let's pull together

Break-up of Industrial Costs

The following break-up of industrial costs, published in the **Economic Times** dated 8 October 1962, is extremely significant in the sense of identifying areas for intensive productivity effort.

Percentage Distribution of Production Costs

<i>Industry</i>	<i>Material</i>	<i>Labour</i>	<i>Power Fuel and Repairs</i>	<i>Other Expenses</i>	<i>Interest</i>	<i>Depre- ciation</i>
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Cotton Textiles	58	27	6	4	2	4
2. Sugar	81	10	3	3	2	2
3. Cement	42	17	19	10	2	9
4. Paper and Board	47	16	17	8	2	10
5. Construction	61	25	4	6	1	4
6. Chemicals	51	13	12	14	2	7
7. Flour Mills	91	3	2	3	1	1
8. Glass	35	22	22	11	1	7
9. Paints and Oil	53	23	1	18	1	1
10. Pedal Cycle	64	15	4	10	3	5
11. Automobile Manufacture	77	11	3	4*	1	4
12. Machinery Manufacture	59	23	3	8	2	4
13. Light Electrical including Radio	62	19	2	14	1	3
14. Engineering (other)	69	13	4	6	1	3
15. Collieries	14	62	10	8†	2	5

*Includes Royalty (.58%)

†Includes Royalty (4%)

.....He has a very good background and spends all his time leaning against it....."

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Cost Reduction

JA Paterson*

It is astonishing to find that in the vast majority of companies, the subject of cost reduction has never been properly tackled, and indeed in many, has never even been given a single thought. On the other hand, cost control is practised in varying degrees, but even when practised, it is true to say that in the majority of cases there is a very lethargic and even negative approach to it. A distinction must however be drawn between cost control and cost reduction, because they are by no means the same.

THE MOST MODERN FORM OF MANAGEMENT accounting which embraces the principles of standard costing and flexible budgetary control is a technique which, if operated efficiently, will disclose at regular intervals to management deviations from anticipated and accepted standards. These deviations arise in costs of material, labour, manufacturing overheads, administration and marketing; if the principle of setting standards is also projected to include the establishment of standard selling prices, then deviations from standard profit arising due to divergences from predetermined sales will also be disclosed. A display of such variances is the best known method of controlling adequately and effectively, costs and sales; it must be remembered however, that since flexible budgetary control suggests the practice of management by exception—in other words, and in simple language, paying attention to those things which deviate from plan—it will be natural to accept as reasonable those aspects of business which do not so deviate. In other words, cost control, when it is practised at all, tends to accept standards and consequently to lack a certain amount of aggressive approach which is demanded by cost reduction.

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Cost reduction, on the other hand, suggests that every standard must be constantly challenged, and that in any business there is no single sphere which should escape attack.

In order to put into practice a scheme of cost reduction, it is *obviously essential to plan*. This is no more than sound management; a team representing the departments of purchasing, design, production, sales and costing, should actively concern itself with every aspect of cost reduction. It would be worthwhile to design a few standard forms, so that records may be neatly arranged, time saved, and a means of recording anticipated work, completed work, resultant savings and progress generally maintained. Each project, as it is approved, should be given some degree of priority based on anticipated savings, and should most certainly be given a date for completion, so that progress may be continuous. When it is remembered that cost reduction embraces all phases of business, it is important to provide facility to all workers and supervisory staff to contribute ideas; it will be found in practice that, if encouraged properly, workers and staff will have many ideas; while some of them may not be feasible for one reason or another, the majority of them, if properly accepted, will lead to major cost reduction activities.

Before outlining the areas of attack, some of which will be obvious, it is suggested that much value is to be obtained when a scheme of cost reduction concerns itself firstly with a sound appreciation of acceptable profit. The normal approach to profit is one which goes no further than a complete acceptance of the fact that profit is the balance which is left after deduction of total expense from total sales. While this is an

indisputable fact, it is suggested that where cost reduction is concerned, an exactly opposite approach to the question of profit should be made, inasmuch as profit expected should be determined first, and its value deducted from total sales in order to establish the amount of expense which is permissible. Revolutionary though this may sound, it is the only way of approaching cost reduction. At this stage however, a word of warning is essential. To be successful, cost reduction must result in reductions in unit costs of goods manufactured or services rendered without in any way impairing their suitability for the separate uses for which they are intended. This in no way however suggests that there do not exist instances where products are of an unnecessarily high quality.

Organisation itself should be systematically examined in order to ascertain whether or not it is adequate to meet the demands made on it. It should be one of the primary areas of attack in a scheme of cost reduction: furthermore it should be the subject of examination at periodical intervals, because no matter how sound an organisation may have been in its initially constructed form, there will be no automatic perpetuation of soundness, unless revisions are made in the light of changing conditions. Hand in hand with organisation is the adequacy or otherwise of internal communications, and here the scope for intelligent appreciation of requirements will lead to savings in cost. It is true to say that except in the very well managed companies, a vast amount of time, and so money, is wasted, because communications are inadequate.

The procedures which exist in many enterprises are the result of continued growth, and there is a large field for improvement in most cases. There is no phase of business which does not have its own particular procedures and the adequacy or otherwise of these procedures, must like organisation itself, be critically examined. When it is remembered that adequate procedures result in materials, tools and labour being made available at the right time, it will be obvious that research into procedures can produce very great savings. This area of attack is so enormous that it is suggested that at least

one person should specialise in this important aspect of cost reduction.

Production planning is made effective in different ways. The particular type of product manufactured usually determines the most effective method of production planning. To be effective, *production planning must be based upon a sound sales programme*, and it must recognise the importance of careful determination of batch sizes. It must relate machine loading and labour requirements to the capacity which is available. Where idle capacity exists, efforts must be made to utilise it as economically as possible.

It has been stated that the true measure of value in purchasing is how effectively and economically a material or a product serves the purpose for which it is purchased. Provided that this is at all times recognised, attention should be concentrated upon achieving this measure. In examining the function of purchasing, a cost reduction committee should consider four important facts (a) the amount of capital invested in stocks (b) the economical quantity to order (c) the maintenance of close liaison with suppliers (d) the insistence upon prompt delivery.

There is perhaps no greater field for cost reduction than the field of product design. The majority of manufacturing costs can be traced to original design of a product. It will be obvious therefore that unless the views of production engineers are considered at the time of original design, many unnecessary costs will be incurred in the shape of unnecessary tools, jigs and fixtures. Material specifications should be examined in the light of possible substitution of less expensive materials, without again in any way impairing the quality of the final product. Where sub-assemblies and assemblies are concerned, great care must be taken in the designing stage. It will be found that many sub-assemblies and assemblies are unnecessarily complicated, and so therefore unnecessarily high in cost, because sufficient time was not devoted to them during the original designing of the final product itself. Very large sums of money can be saved, especially in the engineering industry, if designing is scientifically carried out. The Cost Accountant should, although he very rarely does, play a very large part in the deter-

mination of the cost of design. It is not usual to find new products being designed and produced before any proper and clear idea of their cost has been ascertained.

While the advantages of simplification and standardisation are known to all and are generally accepted, little effect is given to them in a large number of industries. It is obvious that a reduction in variety must result in longer runs, higher productivity, consistency of quality, ease of inspection, economies in design, clerical procedure, advertising and selling, and ultimately lower unit cost. A very determined effort should therefore at all times be made to reduce, *so far as is consistent with market demands*, the variety of products manufactured. Those firms who accept every whim of every customer will have less chance of achieving any spectacular reduction in costs, than those who are prepared to make a conscious effort to reduce the variety of the products which they manufacture, *for a variety of products is the greatest enemy of production planning.*

The economics of indulging in second and third shift working should be the subject of detailed study by any good cost reduction committee. The possibility of introduction of wage incentives must be explored, and where it is decided to introduce such schemes, it is essential that they are based upon very scientific work measurement and time study—in other words that they are introduced by competent personnel. *Indirect labour presents perhaps one of the largest areas of attack and this is especially so in this country.*

Insufficient attention is usually paid to materials handling, and it is suggested that ad hoc investigations should be carried out by cost reduction engineers. Material handling is closely related to plant layout which in itself must also form the subject of determined efforts for improvement. The flow of materials through each department should be checked and the cost of material handling shown separately, so that a full appreciation of what is involved can be made.

Savings can be effected if regular maintenance is carried out, and in this connection it will be apparent that the greatest savings will be achieved where maintenance is carried out before breakdowns occur: *the cost*

of breakdowns cannot be exaggerated. Maintenance expenses should always be charged to operating personnel in order that they may eventually insist upon maintenance of their machines at regular intervals. Records of plant repairs must be maintained and related to initial cost and also to operating time. These records, if properly maintained, will assist when decisions to replace machinery are made.

Statistical quality control is by far the most economical method of ensuring consistency in quality, and if applied scientifically will lead to substantial reduction in inspection costs. Standards of expense should be set for consumable stores, and rigid control exercised over all issues. The cost of fuel, power and water is usually considerable, and again determined efforts should be made to conserve these as much as possible. Cost reduction engineers must take the leading part in this campaign.

More and more attention is now-a-days paid to the provision of reasonable working conditions, and these include welfare schemes, air-conditioning, lighting etc. It is not easy to measure the resultant savings from improved conditions, but there is no doubt that they tend to reduce absenteeism, improve the quality of production, and so ultimately lower overall unit costs. While many enterprises realise the importance of budgets of manufacturing expense, a lesser number appreciate that selling costs are susceptible to standards also. Again, if budgets of selling and distribution expenses are carefully prepared, areas of cost reduction will automatically present themselves. Methods of packing must be considered at the design stage, because very often a slight revision in product design itself will enable an already standardised packing to be used.

The areas in which cost reduction can be effected are numerous and in themselves large. There is no doubt that insufficient thought is at present paid to scientific cost reduction, and it must always be remembered that unit costs may be lowered in two distinct ways a) By reducing costs and maintaining present standards of output. b) By increasing present standards of output without correspondingly increasing costs.

Cost Control through Work Study

William J Hayes

While it is true that *the performance of labour cannot be assessed with the scientific accuracy possible in respect of the other resources of production*, the developments in recent years of the measuring techniques of Work Study are very significant. Their effectiveness means that far more realistic labour costs can now be incorporated into systems of standard costing. Hitherto, the difficulty has been to measure a sufficiently high proportion of work in an organisation to develop really satisfactory procedures. It is only recently that the techniques of Work Study have advanced to the point where this can be done. *The present economic situation, with its demand for higher productivity has caused many industrialists to look towards work study as offering the best solution to the problem of rising production costs.* You can't tell how much you are drifting unless you set stakes. In industry we cannot set our course by the North Star. Our guideposts have to be standards of some kind. The modern concept of standard costs did not come from an accountant; it came from an industrial engineer, Harrington Emerson.

THE SUCCESS OR FAILURE OF A FIRM IN A competitive market may depend on the accuracy with which it is able to price its products. Unless the manufacturing time of the product is accurately known, the labour cost cannot be estimated, and many indirect costs dependent on time, such as plant depreciation, fuel and power consumption, rent, and the salaries of staff and supervision cannot be accurately determined. On the other hand, the adoption of advanced techniques of planning and control may bring about an appreciable increase in the indirect costs of a business. These increased costs must be considered in relation to the saving of cost and other financial advantages resulting from the improved planning and control. These increased costs may be considered as *strengthening the eyes and mind of the business so that the body can be directed to greater productivity.*

Work Study enables high cost elements and positions being spotted. Most people think of work study as a method of setting incentive rates. Actually, it is a means for analysing work. Much waste can be brought out in the open. Management errors are uncovered. Irregular conditions are observed and mea-

sured. When work study and incentive are used correctly, they point out two types of waste time. One is lost time; the other, wasted effort.

It is not sufficient to be able to measure the output of labour. The standard must be carried a stage further and a yardstick applied, so that labour is not wasted. It is not the number of hours spent in the work which is important; it is what is done with those hours which counts. Work Study when applied correctly will bring out proper work standards which are both fair to employee and employer. It has the task of preparing standards for costing and estimating; of establishing the basis of an incentive scheme; of focussing attention on working layouts and the balancing of workloads to avoid idle time and wasted effort. The limitations, however, of work study should be realized, for fundamentally *it is an assessment by human beings of the performance of other human beings.* Further higher productivity through work study cannot be achieved, unless all concerned are inclined to cooperate towards that end. Cooperation is the most valuable asset that any company can have but it *does not appear on the balance-sheet.* ●



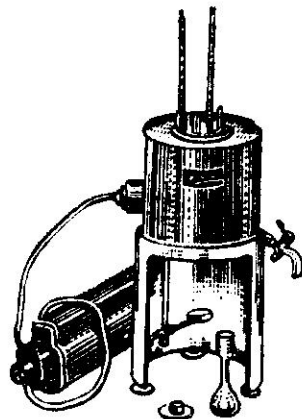
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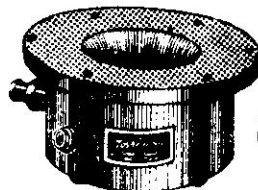
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Costing of Rajasthan Canal Project

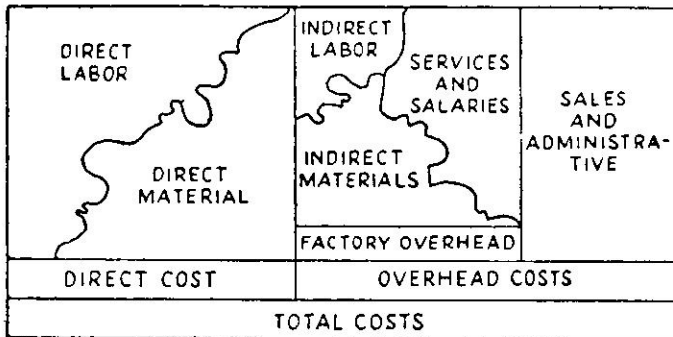
BB Lal*

BECAUSE OF THE ENORMITY OF ITS SOCIO-ECONOMIC IMPLICATIONS, the costing of the Rajasthan Canal Project has naturally to be approached with considerable modesty. The great Indian desert where people lack not only what are called the essentials of life but drinking water itself: this desert is being brought into life. Very obviously, the benefits of this scheme cannot be brought strictly within the framework of the professional budgetary and cost control. An area of undulated, shifting sand-hills 20 to 220 ft. high, where more often than not, the seed perishes as it is sown, where the hot winds scorch men and animals alike, the temperature ranging from near boiling to below freezing point in between the seasons: this area has a virgin sub-soil which in historical times has not been tapped for use of man. Now an irrigation project is going to open—has to a certain extent already opened—this area for a prosperous cultivation, industrialisation, mining of its rich ores, navigation, which in course of time may well connect Northern India with the Port of Kandla. Costing of this project is therefore both difficult as well as limited by the very nature of the case. It is said that crops grown on this virgin soil of Rajasthan can probably save the whole of the import bill on food account, thus releasing valuable foreign exchange for defence and other priority needs. At current prices the agricultural crops to be grown in the new area are estimated annually at Rs. 660 million. It will besides provide drinking water to the people of Bikaner and Jaisalmer as also provide water for the development of animal husbandry and a number of industries. It will enable large forest shelter belts to be established and thus prevent an extension of the desert. Quite a number of industries have been planned on the basis of the economic growth expected: sugar, cotton, oil mills fertilizer factories etc. Large mining areas so far unexploited due to lack of water will become available for development and it is said that fairly large quantities of lignite, gypsum and other minerals will become available to the industrial economy. The law and order situation will become manageable because a number of traditionally hard working tribes, deprived of the means of livelihood have taken to banditry, will now have profitable occupations. Thus the benefits and savings for the social economy as a whole will be incalculable.

Speaking strictly in financial terms the project will be, over a period, not only self-financing but will earn the community a progressively rising rate of dividend on the net sum charged to the account of the project. This percentage return on what may be called the capital investment will rise from 2.50 to 7.28 percent in the 30th year of the project. The entire capital of the project will be recovered from sale of land and betterment levies. This capital cost covering the headworks and storage above Harike, the Rajasthan Feeder and Canal System, a Hydro-electric Power House and Navigation is estimated at around Rs. 212 crores or Rs. 432 per acre. The total cultivated area within the command of the project is around 5 million acres. In physical terms this project will require an earthwork of nearly 300 million cft. It has been so planned that $\frac{1}{4}$ of the work will be done by manual

*Divisional Accountant, Rajasthan Canal Project, Suratgarh.

labour and the balance by machinery. The total employment requirements of the project are estimated at 20 thousand workers per working day. About 200 metre gauge wagons will be required everyday for a period of ten years to transport the construction materials required for the project. For reasons of space it is really difficult to give here details of all the elements that would enter into the costing of this great project; a costing unit has been set up from the end of July 1961 which is so organised as to act as a sort of searchlight, pointing out the various causes of waste and what is most important the many directions in which needed improvements can be made. Detailed accounts are kept of the use of manpower, machines, vehicles, their breakdowns, their rate of output, and on the financial side not only the actual expenditure is budgeted but account is taken of the unliquidated liabilities of the work in progress. Constant reviews are made so that the project authorities get the opportunities of putting the resources to maximum use. As already said, however, the benefits from irrigation, afforestation, mining, industrialisation, electricity, navigation, the security of livelihood from the exigencies of a nomadic life are really incalculable and mark the limiting point for the cost accountant.



Cost Control for Fertilizer Production

BK Mukherjee

A considerable stepping up of agricultural production has been the main basis of economic planning in this country since independence. Since such a massive increase in output is not possible without supply of fertilizers, government itself has put up two substantial plants at Sindri and Nayanangal. In the private sector also there are three fairly large plants at Allwee in Kerala, Belagula in Mysore and Varanasi in UP. The government factory at Sindri and the private sector at Allwee are being expanded. Besides, government is constructing or planning to construct fertilizer factories at Rourkela, Neyveli, Trombey, Namrup, Durgapur, Gorakhpur etc. A number of private factories are also being constructed or planned: Ennore, Vishakhapatnam, Kothagudam, Ankleshwar, Tuticorin, Mangalore, Hanumangarh, Koyner, Itarsi etc. It will however take some time before all these factories are commissioned for supply to our agriculturists. When that happens, competition itself will compel cost consciousness. In the meanwhile, while aggregate demand exceeds the aggregate supply of fertilizers it is in the public interest that cost consciousness should be in-built into the management organisation of fertilizer factories. Particularly from the public point of view it is essential that accurate costing should be done in the public sector enterprises, as the Ministry of Agriculture fixes these prices. Government must know the exact element of subsidy, as it has been decided to put up these fertilizer factories in the public interest, considering the increase in population, the supply of irrigation water, intensive cultivation, etc.

LOCATION AND TRANSPORT COSTS HAVE also to be taken into consideration because fertilizers have to be transported to the agriculture areas where they are needed, particularly to places which government desires to develop in the public interest. Then there is the question of the availability of raw materials which enter into the production of fertilizers. As this is a very poor country and by and large our agriculturists are very poor and cannot afford additional costs, we have to calculate this cost exactly and try to keep them at the minimum.

Certain technical details have to be taken into consideration when costing the production of fertilizers. Many of the processes involved are really continuous, as this is really a chemical industry with its peculiar problems and uncertain operating conditions

such as temperature of water and air, atmospheric circumstances, temporary shedding down of plant due to maintenance etc. Then apart from the finished product such as ammonium sulphate, ammonia, coke etc., the fertilizer factories get on their hands a number of important byproducts such as coke, raw material for cement, coaltar, benzol, coke oven gas, fuel gas, carbon dioxide etc. Sometimes the byproducts themselves become the main raw material for the processing of an important fertilizer such as ammonia made out of coke oven gas. Many of the major raw materials are themselves the byproducts of important lines of manufacture such as steel. Thus there exists a degree of integration which makes costing at the one end difficult and at the other extremely important because we have to be extremely careful in the fixation of public prices. Of course in

a public sector there would be the question of accounting for the general overheads on what point to begin and on what point to start and then with the technical problem in this line of accounting for the catalysts. In fact the accounting in this line has to be fairly conversant with the technical processing because there might be, in fact there are, a number of different processes by which the same fertilizer can be processed as for example ammonia from water and air without coke oven gas or by utilising natural gas, refinery gas, naphtha, lignite etc. In a public concern account has to be taken of expenses in connection with welfare state, administration, planning and development (research, designing new projects etc.) maintenance workshop etc., transport and stores. This would have to be accounted for also for private concerns but government has to be particularly cautious because of its standards and the rigid classification of accounts as required for purposes of audit. In a fully mechanised fertilizer factory depreciation account is a very important element of cost. This however is a purely accounting matter and can be taken care of by experts, what probably is most important is the introduction of standard costing in public concerns; for it would provide the simplest, the quickest and most helpful aid for management for its control of cost, in its control of idleness, waste and other inefficiencies and its objective of earning more profits. Incidentally the Third Five-Year Plan provides a fairly large volume of financing of development by the surplus profits of public enterprises. As these plants have been established at a considerable cost to the public exchequer, it is necessary that the fullest possible use may be made of the installed capacity. It is true that in new factories fixation of standards would be a strenuous matter particularly when many items are grossly approximate and the level of production has not been stabilised. It is true that in new factory variations

from actuals would be abnormally high but this should not be a cause for frustration for certainly better standards could be established when actual costs at certain levels of activity become available after a year or so of working of the factory. But it is of the utmost public importance that fixation of standards should be undertaken at the earliest, and an organisation set-up analysing actual costs and classifying variances from standards under different categories, particularly material yield variances, labour variances etc. Attention has also to be paid to the difference between the actual and the standard overheads, material price variances and last but not the least plants productivity variances for each production centre. In fact the system of cost and budgetary control should be established as a guide in the supervision of every division, looking expenditure in accordance with persons responsible for incurring it with the objective to control each function ensuring the best possible performance. Engineers and accountants must work in close coordination in their search for maximum efficiency methods. Management must be able to get at short notice upto date information regarding the output of various lines and the cost per unit in each line, the total cost of production in the factory as a whole both historical, the present and the perspective. The costing department has to be judged by the promptitude with which this information is supplied as a basis for management decision as they have been taken. In fact an inter-firm comparison system including the private fertilizer factories could be established so as to make the most productive use of the very large resources that are going into the fertilizer production so that our lands may yield the maximum for feeding a population of 450 million increasing at a compound rate of 2 percent per annum and also to feed the factories with raw materials on an ever-increasing scale.



Cost Control in Mining Industry

DD Kalra*

The mining industry costs include certain peculiar items not normally met with elsewhere. For instance before a mine comes into production large sums of money must have been spent in prospecting and exploration work, a substantial part of which may even have proved infructuous and even when a promising area has been located a huge amount of money has to be spent in its development, in building an approach to the ore body and in providing ways and bye-ways for men, machinery and materials to move. These prospecting and exploration costs in full or part according to policy and the pre-development costs and the cost of building the highways of entry and exits into and from each level at which mining operations have to be carried out, which will cease to be of any value when the mine has been exhausted, have to be recovered in full during the effective life of the mine. On this backlog of expenditure, which often is a colossal amount, there is hardly any control. Another peculiar feature about the mining industry is that with the exhaustion of the mine almost the whole capital invested in it becomes extinct. Still another peculiar feature is that in the majority of cases due to their location in out-of-the way places often in torrid mountains or thick forests, where no civic amenities are available, the mining industry has to incur huge expenditure in providing its own amenities like waterworks, electricity, hospital, schools, transport etc. Besides mining proper which this paper covers, the industry has other departments; the Mill Department in which the ore is crushed and the different kinds of ores are separated by chemical processes; Smelting House where the virgin metals are recovered from the concentrates etc.

COST CONTROL IN THE MINING INDUSTRY CAN be easily understood in the context of the terminology used in the industry. The place of ore body is called stope; the attack on the stope to win the ore is called stoping; the main entrance to the mine, usually in the form of a lift is called the main shaft. The tunnels to approach the ore body at different levels are called Drives; the ways up from the Drives to the ore body are called Rises and the ways down are called Winzes; the total amount of rock blast and taken out including both ore and waste is called ROM (Run of Mine); ore excluding the waste is called ROM ore.

The expenditure on the main shaft and Drives is treated as Capital expenditure to be written off by way of depreciation over the working life of the Mine. All the

other expenditure on raises and winzes and on development is treated as revenue expenditure and is charged to production as incurred. The general operations which have to be carried out inside a mine irrespective of whether the work in hand is actual stoping or development or even of building the main shaft or Drives are as under: Drilling, Blasting, Scaling, Mucking, Trimming and Timbering. For the purpose of control the labour and material expenditure incurred on each working place is shown under the above headings so that any variation from the normal may be localised and investigated and a check on the efficiency factor of each different category of labour, drillers, blasters, muckers, trammers etc. may be watched.

For purposes of cost control, an annual budget of anticipated expenditure on men, machines and material is framed with due regard to anticipated production programmes.

*Fellow of the Institute of Cost and Works Accountants.

constitutes a sort of cealing on all expenditure. There is besides a day to day check on expenditure, the Mines Departments forward to the Accounts Departments man allocation reports each day separately for stoping, stope preparation, development and general services, details of quantum of work done and wages spent for each of the jobs described above. Further there are details of work done by and wages paid to timber men and other miscellaneous workers, for haulage, water pumping, hoisting, assaying, mines maintenance, surveying, ventilation, etc. At the end it is possible to construct a monthly account of the labour cost allocated to each working place and services.

As regards materials—the main material being timber and material used for blasting and drilling, besides the multifarious variety of other stores used for day to day mines maintenance, ventilation, water pumping etc. these materials are drawn on requisition for each working place quoting the stope number etc. so that it is possible in the case of each stope to know the quantity of blasting and other material used per tonne of ROM or per meter of hole drilled. There are, however, certain drilling materials and other miscellaneous stores (compressed air etc.) where it is not possible to allocate them directly to different working places. These are charged to a suspense account and allocated at the end of each month to different working places on the basis of meters of holes drilled or on tonnes of ROM reported

otherwise. Timber is also drawn in a separate suspense account and cleared later by allocation to various working places on the basis of number of man-days of timbering in the daily allocation reports.

As regards hoist and other machines, the number of hours worked by the machine against each working places, stope or service are collected as also the details of the wages of drivers, mechanics etc. employed on these machines. For each machine an estimate of running expenses per hour is prepared taking into consideration the depreciation, maintenance, cost of fuel etc. and each working place is charged accordingly. The difference between the actual working expenses of the machine and the estimated rates is debited to general mining over-heads at the end of each month.

At the end of each month, mining cost sheet is prepared showing the total amount spent and the cost per tonne of ROM (this month and last month) for each of the element of costs; stope working, blast development, underground general services prospects etc. Each of the element of cost such as scaling, drilling, mucking, blasting, timbering, miscellaneous is again analysed under labour and the cost per tonne of ROM worked out under each of these heads after "this month last month." Quite a number of other details of cost are worked out such as drilling cost, per meter of hole drilled etc. Thus the cost statistics of the mining department can be used as fairly useful to measure the efficiency of men working from month to month. ●



Does each man grind tools to his own pet shapes?

Costing of Road Transport Undertakings

PJ Kurian*

The costing of Road Transport Undertakings has certain peculiarities on account of the high depreciation of vehicles; the constant need for repairs and maintenance; the expenditure on running staff, fuel, lubricants, tyres, tubes, tickets etc. The whole organisation has to be geared up for maximum vehicle utilisation and the most effective preventive maintenance. On the income side, earnings are almost entirely derived from passenger and goods traffic, for both of which the markets are different. The capital account is concerned almost wholly with investment in new vehicles, machinery, equipment, workshops, garages etc.

THE CURRENT ACCOUNT IS DOMINATED BY repairs and maintenance, expenditure on materials, spares etc., besides salaries wages and the bills for power, lighting, compressed air, etc. It is most essential in this connection to work out the cost per running mile of each vehicle according to age, depot etc. The cost accounting of the maintenance branch or the central workshop of the organisation should be pretty well kept in a detailed and significant manner. It is very obvious that the control of expenditure at this point needs a costing system. The cost of labour, materials and overheads should be specifically accounted for and allocated to various vehicle groups according to type, make and age. This will help in the formulation of a sound investment policy.

Detailed accounts would be required for various purposes: (1) Traffic analysis statement showing routewise, the total receipts per vehicle's mile, (2) Miles per gallon (mpg)

figures for fuel and oil for every vehicle in the fleet with averages for each group of vehicles according to their make, (3) Occupation ratios (actual number of passenger miles divided by seats based on seat capacity) for every route, (4) Average loading for lorries in tons, (5) Average cost of a complete overhaul during the month subdivided under engines, chassis and bodies, (6) Tyre mileage statistics expressed as miles per tyre used, and subdivided according to types of vehicles in use and also makes of tyres. These statistics are also divided according to depots (garages) since road conditions appreciably affect mileage. There should be a history card for each type in service indicating the make, size, date of fitness, vehicle numbers and mileage.

It is also good practice to maintain a vehicle log-book which records besides various particulars about chassis, engine etc., also the monthly mileages operated, the mpg, repairs undertaken, break downs, etc. This will greatly help the formulation of a replacement policy.

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Cost Control for Refractory Works

AK Sen *

THE COST AND PRICING OF REFRACTORY products have certain peculiarities because of the nature of the industry. A refractory works uses bulky raw materials of comparatively low value to be purchased substantially in advance of requirement, thus involving a considerable type of capital in inventories. It requires large quantities of coal for firing. Materials handling is distinct from production operations and constitute a good proportion of total cost. The rejection at various stages including at the customers' end is a serious problem in the line. The market in standard bricks is highly active so that the refractory works has got to make it up by special shapes and sizes for which spare capacity has to be maintained. In order to keep the cost within bounds it is necessary to maintain a continuous record of each item of material, its unloading, stacking on a uniform piling basis, issue of raw material on 'first in first out' basis. It is particularly useful to have a monthly stores issue summary card for each case with the standard worked out and the entry on the top of the column for each item. For each single card it is advisable to have a record for rejection, details of defects in manufacture, packing, handling etc. A separate card for each stage of production would help in planning production and the most effective utilization of machines and men. The production record card of moulding should be made preferably for individual worker of individual machines. These cards would enable potentials to be studied, standards fixed etc. The most important card, however, is kiln loading and unloading which along side a

kiln utilization statement is a powerful instrument for control of cost, for in many refractory works kiln is a bottleneck of the limiting feature of production. Not only these forms enable the works management to find out the total time required to load, fire and unload each type and the gross surplus at the monthly rate for utilization and the relative product. Firing cost is about 25 to 35 percent of the total cost of conversion. This method would also enable the management to make economy in fuel by calculating the gross mileage per tonne of coal used or for every hundred rupees spent on fuel. For reasons of space we cannot mention here the other type of cost recording that would be greatly valuable in this line, such a prices, output cost, all purpose sales documents, labour records so vital to production control.

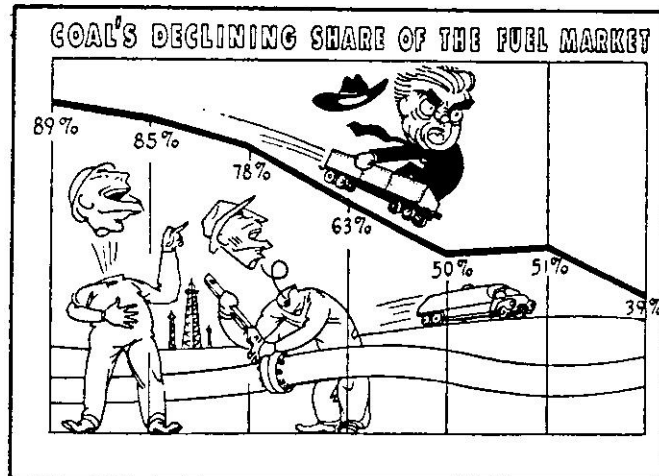
All these methods and procedures are essential for costing in refractory works is really difficult. Accurate process costing for each quality short of each size and shape is rather impossible in plants where same crushing and moulding machines, hot floors, kilns and men are employed for all qualities, sizes and shapes. The process costs are therefore joint costs. Only when hand and machine moulders are paid by a system of piece rates, it is possible to find out the actual moulding labour for each item. Therefore, to find out total unit cost of each quality of bricks and shapes, the total departmental or process costs must be allocated over the qualities. This business of allocation on whatever basis it might be made, is a guess-work and liable to bias. The orthodox total costing is not required for internal control

* Burn & Co. Ltd., Raniganj.

of works operations nor is it possible to fix a selling price in a competitive market on the basis of costs. The prices current are those which the market will bear. Only when a fairly large order for specials or a valuable order for a small quantity of complicated specials is executed, it may be necessary to prepare sample all-in-costs to check with the quotation.

It is possible to argue that costing in refractory works by each shape, size and quality is neither possible nor necessary only because each makes the difference in moulding cost. However, we may give here a broad break up of cost in refractory works: raw materials 15-35 percent, wages 20 to 30 percent, fuel 10 to 15 percent, stores and spare parts 5 to 10 percent, repairs to machinery and depreciation 5 to 10 percent. It is advisable to collect these items of cost and to fix as far as possible as standards in quantity, rate and value for each of these elements. As it is not possible to directly charge to each product any of these items except raw materials,

we suggest use of process cost standards per tonne of each kind of production. The expenses which are directly identifiable with each process should be lumped together as the total cost of the process. Against this will be set up the process cost at the fixed standard rate per unit of each quality and total standard cost absorbed. Any excess or shortfall of allocation will mean efficiency or inefficiency of the process concerned. It may be added here that a knowledge of relative margin of existing classes of production would enable the works management to fix an expected price for a new line of production. As far as possible, every works must fix the most remunerative combination of orders, and try to book and execute orders accordingly. It is above all necessary to have ready information to assist the management in formulating and adjusting policies to the requirements of running business at the most profitable level. Probably we may add that there is in all these businesses, as probably every where, much scope for research.



Costing of Agricultural Products

S Sen Gupta

The thesis presented here is a pioneering attempt in an obviously difficult field. Considering the difficulties it is rather a very tough job to pioneer in the direction of cost accounting of agricultural products. While working in the field, the farmers told the author that it was bad to think of any cost for raising agricultural produce, as bad as to calculate the expenses for maintaining a child! Such being the feeling of the majority of the people in agriculture it is really very difficult to assess the cost of agricultural products. In spite of all this, the author's faith must really be considered: "we should at any cost take to *some practical application of costing system towards our agricultural produce*, particularly in view of the fact that our state policy of cooperative farming is rapidly taking shape. Unless proper accounting principles are evolved how can any collective work progress? So long as agriculture was a purely private and individual affair its accounting could have been relaxed but as soon as it becomes a joint venture, proper accounting and costing must be taken resort to." Yet when the author mentioned this important subject to a cost accounting *pundit*, he almost fell from heavens and explained as to the impracticability of a planned cost accounting technique to so raw and dispersed a field as agriculture! The fact that agriculture accounts for an overwhelming portion of the national income and directly supports 80 percent of the population did not count with our cost accounting expert.

The author is however convinced that it is worthwhile despite the difficulties to evolve even a crude method of costing for agricultural products.

THE DIFFICULTIES INVOLVING EVEN A ROUGH and ready method of cost accounting for agriculture ought to be appraised very carefully: the utter poverty, illiteracy, lack of enthusiasm among the agricultural population; paucity of appropriate data even with regard to large holdings and prosperous farmers reluctant to disclose true facts due to fear of agricultural income-tax or the law; variability of basic data from farm to farm; heterogeneity of the various costs that enter into production of agricultural produce, the difficulty of classifying them, their amenability to cost accounting methods.

Should we for example treat cost of seeds and manures as variable prime cost? How about re-soiling or deep ploughing whose costs may be recovered in several years; the improvement of irrigation facilities; costs of maintaining bullocks and other cattle; their original cost and depreciation; similarly the cost and repairs of agricultural implements? To all these pertinent questions hardly any

replies can be obtained from the farmers and the cost accountant has to make his own guess with the result that an admixture of variables and overheads takes place and no proper evaluation can be made.

The real difficulty is that agriculture in this country has been traditionally and remains so far, the most part, a non-monetary economy. Labour is supplied with food and habitation during the working period. Foodgrains are usually supplied from the stocks of previous year's produce and there is hardly any account either of its quantity or price. Materials for raising temporary cottages are not purchased from the open market but supplied from the property of the farmer. The farmer and his family work on the farm on time and off time. Sometimes there is too much work and many times there is no work at all; and the work cannot be evaluated because there is no question of alternative income. They consider as God sent whatever remains after paying the cost of seeds and

manures actually purchased, wages of hired labour, rent of the landlord, taxes including canal tax. They go on a commonsense cash basis. The Ricardian theory of rent that it does not enter into the cost of production is considered bunkum. The agriculturist does not concern himself with such refinements whether rent is a fixed overhead or direct and prime cost, whether canal and other irrigation taxes are direct costs or fixed overheads. He is concerned with the fact that these are costs as also the road cess or education cess and all these costs are a draught upon his cash resources.

Of course there would be in the evolution of a costing system a number of technical difficulties : how to distribute costs between successive crops, how to account for green manures, raised partly for fertilising the field, partly for feeding the cattle. If we really seriously apply a system of cost accounting to agricultural produce we would find that the cost per unit of output would be too low on account of the amount of certain essential factors or too high on account of uneconomic holdings. Many anomalous situations would arise, such for example as the author saw a farmer raising four or five different crops on a plot of land barely a fourth of an acre : how on earth can any one measure the costs in such cases? Obviously, people interested in accountancy and costing shall have to put their heads together to devise ways and means for many such situations are frequently met with in the field of agriculture.

Probably we would begin working in the field of large scale farming. We could do a lot of work in state farms, we can begin working in the field of cooperative farming, for unless we begin working we shall not be able to evolve a properly scientific system of accounting. This is particularly important in a regulated economy. We have seen prices rising, when the monsoon fails us. We

have also heard the hue and cry in times of bumper harvest that a low price should be fixed to save the agriculturist from collapse under burdensome crops! We must make an enquiry into the cost of production of sugarcane if we want to establish a rational basis for sugar prices. We cannot allow these things to go on, if we want to develop our economy along planned lines.

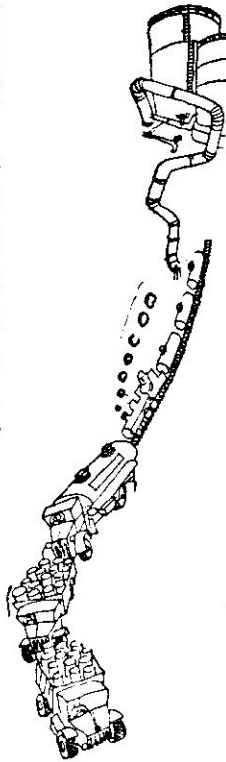
Of course the difficulties are really many; and we may not be able to surmount some or even many of them for quite sometime. Our agriculture is yet partially atleast a gamble in the monsoons. Heavy costs may be incurred but a draught or flirt may wash away the entire crop. For that probably we shall require some system of crop insurance. But that in itself shows the necessity for an appropriate system of cost accounting without which no system of crop insurance will work. We may in the first instance work on certain very typical items of agriculture and the statistical tables that we shall build up will really look like some live tables in actual science. It is bound to be a very complicated system because in agriculture we really deal with living cases where variations in the input output ratios are inevitable as against manufactured in which the input output ratios are more or less certain.

We are thinking of increasing our agricultural output by a very considerably margin. Our target of foodgrains alone is a hundred million tons; and our entire planning depends on massive increase in the field of agriculture. We are thinking of cooperative farming and such other methods. This substantial increase in agricultural output and radical changes in the pattern of farming must necessarily be evaluated. They cannot be evaluated without a system of cost accounting. Even otherwise community is entitled to know at what cost increases or changes are brought about.



JOURNEY'S END

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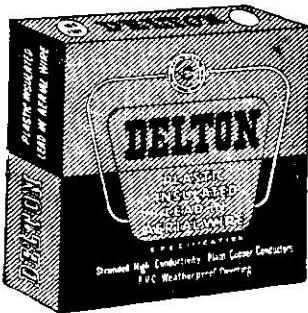
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The Ansul Case

Robert C Hood*

The Ansul Chemical Company was started 50 years ago to manufacture liquefied gases. At the present time, we have 520 employees and total sales of \$12½ million per year. We manufacture products for the refrigeration industry, industrial chemicals, and dry chemical fire equipment. These are distributed in the main by our own offices and sales people throughout the United States and 62 foreign countries 12 years ago I became president. In trying to determine a 'plus' that I could contribute to the company's progress, I decided that improving the company communication programme would aid every operation. As I delved further into this study, I began to realize the real aid that social science was giving industry in this area. What I was hearing and reading made a great deal of sense to me. From it we developed a philosophy of management which we now call 'participative management'. If industry had thoroughly accepted the physical sciences as a means of survival, I felt the social sciences as they developed should also be worked into the development of modern industry. I found that universities and colleges were conducting research which supported many of the principles under which we had been operating intuitively and which had expanded these ideas effectively. I began to realize that today *managements as well as products are competitive*. Therefore, just as much attention should be paid to the development of management as had been devoted to the development of products.

WE DECIDED THAT THERE WERE THREE POSSIBLE approaches to the cost problem:

1. Across-the-board reduction (fixed percentage) 2. Selective reduction (by division and department) 3. Participative cost reduction programme (no fixed percentage). As we discussed and reviewed these approaches to the cost problem, it became rather evident that each of them was quite different and that each could be used with unique effectiveness under varying circumstances. It appeared that the first—across-the-board reduction (for example, 5 or 10 percent)—was the one that we heard most about. The second method—selecting varying percentages in different areas—would, of course, require more people and more judgment. In the third—the participative cost reduction programme—no percentages were set; the job was tackled in quite a different way.

We of course set up a number of committees and groups and we had the usual meetings and conferences. But one of the unusual things in those days that we did was to invite Dr Floyd Mann of the University of Michigan to talk to us about research in the area of cost reduction, about the successes and failures of other programmes, and the theory and background of our contemplated programme. Dr Mann pointed out the difference between cost reduction and cost concern. This seemed very superficial at the moment and took quite a while for people to understand. 'Cost reduction' was so firmly implanted in our minds that 'cost concern' seemed a little anemic. Dr Mann, however, pointed out that cost concern was a matter of changing a man's attitude, while cost reduction was the physical reduction of cost. Our aim was cost concern, since we knew that cost reduction would follow if the first was accomplished. Dr Mann emphasized that the success of any programme

*President, Ansul Chemical Company, Marinette Wisconsin.

that we were to develop at this meeting was dependent upon the behaviour of the men after they got back on the job. The whole organisation would continually test what we were saying and what we were doing to see whether we really meant business and in just what way we meant business.

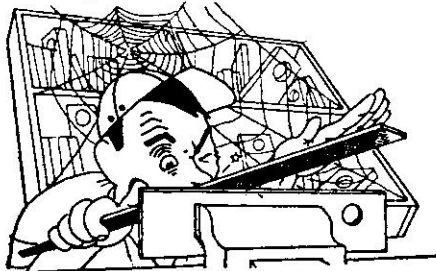
Thus our method of cost reduction was at that time somewhat unorthodox; for in those days and even now to a large extent when any company tackles a cost reduction programme, it *fixes* on manufacturing costs, sales costs, and direct administrative costs as some of the first and most likely target areas to move into. The almost complete absence of these from our early meeting is therefore noteworthy, but *what we were after first was an attitude, not immediate cost reduction.* People change their attitudes slowly; therefore, we feel that those things which we all said we would do after leaving the first meeting were important symbolically. They went a long way toward creating cost concern in our minds and resulted in a direct behavioural change.

We continued our meetings and conferences but our main concentration was on Dr Mann's sociological techniques. We however appeared to make no remarkable progress except that the cost curve had stopped its upward spiral. But we were all conscious by now that enough cost concern was in the blood stream of the company that results would be forthcoming. No elaborate reporting or control system was developed—a fact which made the systems that we had

in existence much more meaningful. Our budget control meetings were much more lively and much more competitive. All the means of control were more sharply used. It was now time that this cost concern idea had its full impact in the manufacturing area; and we made out in extremely detailed lists of specific phases of manufacturing costs in which results could be achieved. This list occupied several pages and there was not a nook or corner of the system that we did not cover. Our participation philosophy was now in full play, for it was not found necessary for a manager to tell the foreman to reduce a given specific cost. The results during the second year of the programme are worth summarising: increase in net profit by 40 percent, additional \$ 40,000 paid in wages and salaries at a time when for extraneous reasons there was a slight reduction in sales volume. At the top of it we were all confident that our cost budget realisation could be 100 percent. Some of the more intangible results that we feel we gained from this programme may be listed as follows: (1) The success of the cost-concern programme made the company's participative management philosophy more understandable to all management levels and to employees. (2) The programme provided a successful situational training opportunity for all involved. (3) It led us into a series of meeting clinics to improve the effectiveness of our management meetings and reduce the time spent in meetings. (4) It led to a variety of improvement and capital assets expenditures. ●

HOW FOREMEN CAN CONTROL COSTS

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Quality Control in Swiss Watch Industry*

THE INTRODUCTION OF COMPULSORY CONTROL in the Swiss Watch Industry in September 1961 has an interesting and significant history. In the prewar period Switzerland had practically a monopoly in the manufacture of quality watches. In the postwar period many countries including the USA, Germany and ourselves started manufacture of watches, claimed to be as good as the Swiss. On the other hand, the Swiss industry threatened by world competition also experienced the emergence within itself of elements which began selling at cut-throat prices irrespective of quality in order to retain whatever they could of the fabulous prewar market in Swiss watches. Naturally, the quality manufacturers in Switzerland greatly suffered; hence they gathered together in sheer self-defence and introduced optional quality control in April 1960. It has since then been made compulsory from 1 September 1961. The results even of optional quality control have been remarkable: within a single year, at a cost of only 2 cents per watch produced in Switzerland, over 40 million watches have been tested and the number of below-par watches has been reduced from 46 to 10 percent!

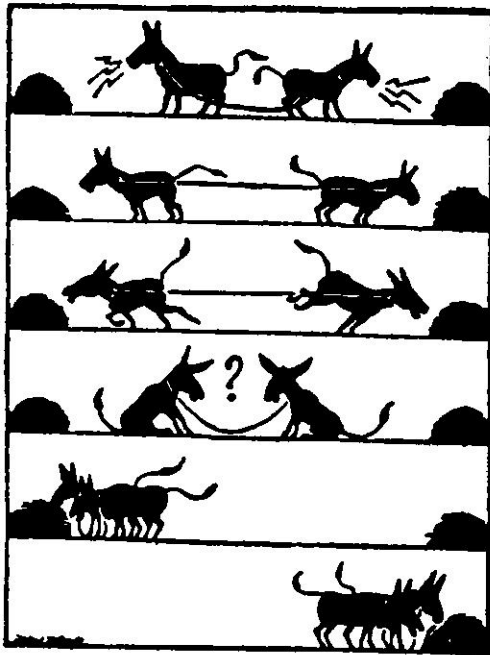
The Federal organisation of Swiss watch manufacturers has now 13 testing centres, each equipped with 4 to 12 machines, designed to guarantee a good lasting performance for each watch by testing them daily at different windings, temperatures and positions. The aim of the tests is to help manufacturers, in a practical and effective way, to perfect their production systems so that they can reach and even surpass the standards imposed. With this end in view that centres have been staffed by specialists: watch making technicians, qualified watchmakers and repairers.

The testing procedure does not aim to test each watch, piece by piece, but instead tests random samples following a chart of statistically planned selections. The following three main problems had to be solved: (i) selecting sufficiently strict criteria and standards in view of outside competition but sufficiently low at the outset to enable firms to bring their watches up to the required standards gradually. (ii) enabling manufacturers to carry out tests themselves, without their having to buy expensive equipment. (iii) remedying the faults which are shown up by the tests.

A simple calculation made on nine measurements obtained allows daily working, isochronic defects, positional error and thermal coefficient to be determined. The faults indicated by these four criteria give a number called the quality index, which is lower in the better-quality watches (an ideal watch would have an index of 0 and a man's standard watch one of 25). Acceptance standards vary according to whether the watch being tested is a man's watch, a lady's watch or a small lady's watch.

*By courtesy Mass Production August 1962 (London).

The experience of the introduction of quality control has been extremely interesting. High quality manufacturers have welcomed it; once their samples are tested and are found above quality standards, they are allowed a loose form of control. For others, there is a normal control and for the sub-standard, there is an intensive control. If intensive control proves unsatisfactory, then testing before delivery is enforced; for a minimum period of two months, all the products are tested, without exception, and in their entirety. Only those batches which have been passed as satisfactory can be sold by the manufacturer, the others being sent back to him.



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The Magic of Cost Accounting

RV Subramaniam

THE TYPICAL INDUSTRIALIST IS SCEPTICAL of cost accounting because he feels "the selling prices are governed by the market. I cannot increase these prices just because my costs are high. In any case, *a costing system is bound to be costly. So long as I am making profits and my things sell, why should I pay for a costing system!*" Yet as every industrialist knows, there is a tide in the affairs of men; and when things go down, he begins to wonder.

It often happens that the selling price goes up, practically all the costs (raw materials, wages, other expenses) go down, yet the net profits decline. The overall figures do not give a clue as to what has happened, why it has happened and what could have been done to maintain the net profits. The only clue is a decline in the overall sales, but it is only a detailed costing system that would show the significant changes in per unit cost of materials, wages and overheads, which is the most important. In fact, a costing system gives a lot more of detail for identifying the points at which corrective actions could have been and could still be taken. This has an important implication: unless the whole production system is organised in consonance with the costing system, pretty little could be done to take effectively the corrective steps needed to maintain and increase net profits. It is obvious that it cannot be done without for example a proper materials control and labour control to ensure that labour is effectively utilised at the right places etc. The marketing aspect has to be attended to, to ensure the fullest utilisation of the production capacity installed.

Take another case in which an industrialist is manufacturing three products. He maintains his overall sales and is even able to effect a reduction in the overall cost of production. Prices of two of his products are constant, and of the third is in fact higher. Yet there is a 10 percent decline in his profit per rupee of sale. It is only a detailed costing system that can reveal the true picture to our industrialist. A detailed enquiry yields the following highly interesting and significant result:

product	selling price	cost (excluding fixed expenses)	contribution to fixed expenses and profits
	Rs	Rs	Rs
A	5	4.85	0.15
B	13	14.35	-1.35
C	20	9.85	10.15

The whole economic picture now changes, for originally our industrialist had given the highest priority to B because its price was rising. The costing system proved that B in fact was a losing proposition, and that there should have been the highest resource-concentration on C. It reveals how far the selling price of C can be adjusted in case competition emerges. It also indicates that with increasing economies of scale, the product C could be exported to different foreign markets on a discriminators price basis. Thus an accounting system can render the economy not only of a single firm but of a whole industry both viable as also efficient.

Cost in the Dynamics of Automation

Joseph F Morreale*

AS AUTOMATION BECOMES A REALITY, MANAGEMENT must take a closer look at the true cost elements in producing goods. First, the direct-labour content of the finished products will become less and less as plants become more and more automatic.

Second, the amount of capital invested in machinery, facilities and equipment will increase tremendously. The depreciation of such equipment must be included as a part of the unit cost in producing goods, and this figure will reach a sizable proportion. When \$ 1 million is spent to produce 100,000 units a year, a three-year write-off adds \$ 3.33 to the cost of each unit.

The third very important element of cost which will increase tremendously under automation is maintenance. Intricate machinery and drives require a carefully planned, well-engineered approach to ensure continuous operation.

The fourth element of utmost importance in the overall profit picture is the loss which results from equipment failure. Down-time resulting from such emergencies is very costly. It is not uncommon for outages of critical mill equipment in the steel industry to result in profit losses up to \$ 35,000 per day.

Naturally, as plants become more and more automatic, the largest items of cost which will affect profits are maintenance and down-time losses. In a continuous process operation, the failure of a key machine may shut down the entire plant and cut off all return from the invested capital.

Emergency down-time during production not only results in lost production and profits, but also forces upon labour an "involuntary strike". Machinery failure is just as disastrous as a strike when it occurs on a production line geared for high production and involving a high degree of automation.

I have seen this principle demonstrated in the operation of a coal-mine, in which there is a virtually continuous operation from the coal face in the mine to the loading of the finished product into railroad cars. Failure of a motor driving the primary crusher, of a mine car's dumping mechanism, or even of a railroad car's loading mechanism for the finished product has closed the entire operation and sent 3,500 men home until repairs could be made. I have also seen similar occurrences in a continuous baking operation and in a continuous textile-finishing operation, although to a much lesser degree. In all cases, down-time costs were significant.

*Management Engineer, The Wayne Pump Company, Salisbury, Maryland.

Evaluating Research Activities

Clyde W Meder*

As more money, men and facilities are channelled into industrial research, the need for evaluating such expenditure increases. All companies evaluate their research in some manner. However, the methods and the degree of evaluation vary with different companies. Many use a financial evaluation while others use a formal approach. Some use a financial evaluation to develop a type of profit and loss for the research operation. Others use a strictly technical evaluation, and still others use both a financial and technical approach.

THERE IS NO DOUBT THAT RESEARCH IS profitable, but the results of research are not easily measured. Many of the benefits from research are hidden, and it is difficult to appraise their contribution to the success of the company. A further complication may arise in that, even though a new product is developed, the manufacturing operation must produce it at a profitable cost and the sales department must market it. Regardless of the difficulties involved in evaluating research, an evaluation of some kind is required to justify its existence and perpetuation, it may be possible to produce a thing by the ounce in the laboratory but impossible to produce it by the ton in the plant. Nevertheless, fundamental or basic research, while it has no direct application to the product line, may aid in the solutions of other problems.

Management is interested in measuring the financial return realized from research because the ultimate justification for research is based on profits. Research contributes to profits through the introduction of new products which increase sales volume. It also contributes to profits by reducing costs when it improves processes, facilities, and

materials. Finally, an increase in sales volume or in sales price can be achieved by an improvement in the quality of the product as a result of research effort.

The methods of financial evaluation fall into three basic groups of criteria: (1) those related to the effect on sales volume or revenue (2) those related to the effect on savings in materials, labour, or other costs and (3) those related to the effect on profits. In the first group of criteria, consideration is given to the following results of research projects: (i) increased business (ii) increased output without an increase in investment (iii) percent of products from research (iv) effect of new products on old product sales.

The group of criteria relating to the effect on savings in material, labour, or other costs includes: (i) use of by-products, wastes, idle facilities, or less profitably employed facilities (ii) reduction of the product line (iii) better process yield (iv) substitution of cheaper materials (v) increased utilization of labour.

The third group of criteria relating to the effect on profits includes: (i) profit on research *versus* non-research products (ii) profit and loss analysis for the research effort (iii) pay-back time on projects (iv) percent of return on investments. ●●●

*Manager of Administrative and Engineering Budgets, Wright Aeronautical Division, Curtiss-Wright Corporation, New Jersey, USA.

What is Wrong with Accountants?

David L Menzies*

WHAT ABOUT THE ACCOUNTANTS THEMSELVES? First of all, in the business environment accountants are a reserved lot. This is due to the historical function which the accountant has performed in the business enterprise. Second, accountants historically have been processors of past financial facts, producers of financial reports. Having performed these functions, the accountant has felt that his responsibility has been completed and he has failed to look forward to estimate how he can be of further assistance to the total continuous management enterprise.

As a result of the two foregoing points, we find that accountants, as a general rule, have built islands of seclusion of their departments, and this is my third point. They have attempted to gather their flock off into one corner and to adopt the attitude, "This is my domain, everybody else stays out of it." This, of course, has not aided the accountant in ingratiating himself with the other sectors of the business enterprise.

Fourth, accountants as a general rule have been reticent to present imaginative ideas. . . they may have had them, but if so, they have kept them to themselves.

Fifth, as a result of the foregoing, ac-

*President, Mead Johnson of Canada Limited, Toronto, Ontario.

countants as a group have failed to recognise problems of other segments or components of the enterprise. The result is that misunderstanding has been created. Apart from the misunderstanding, because they have not appreciated the problems existing, say, in sales and in manufacturing, they have tended to alienate themselves from other members of the enterprise.

Sixth, accountants, as a group, have a tendency to work by rote—they are inflexible; and there is no room in business today for absolute inflexibility. This does not imply that accountants, in rendering statements, should not be accurate—far from it! What is meant is inflexibilities in such things as customer relations. Customer X is thirty days past due... the regulation of the company reads that at that time a strong letter must go out, and so it is the accountant's responsibility to get that letter out. He knows perhaps very little about the importance of the customer, so rather than discuss the matter with sales or with marketing, out goes the letter and damage has been done. It would perhaps have been far wiser to have discussed the matter with the marketing division first in order to ascertain whether (a) a letter should have been sent at all, or (b) if so, how should it have been worded.

Seventh and last, accountants have failed to sell themselves and their total abilities to management.

Task Setting in Manufacturing Budgets

KS Parameswaran*

Task setting is that portion of *extra* anticipated efficiency set as a target or a series of targets calling for continued drive for efficiency and cost reduction throughout the whole range of manufacturing activities. It has necessarily to be achieved with extra effort, care and vigilance over and above the prevalent levels. There is a certain level of output and quality attainable with reasonable effort. It is always possible to achieve a little more than this reasonable, attainable level, sometimes a lot more. In fact the purpose of task setting is really to ensure a continued drive for all-round efficiency on this basis. Budgeting, therefore, is really more than a yardstick for measuring achievement and spot-lighting pitfalls. Often, executives claim that a certain level is beyond possibility or that a certain state of affairs is beyond correction and remedy, yet everyone knows that the existing circumstances are not always ideal and what is considered as impossible at one point of time becomes possible subsequently. It is, however, necessary to emphasise that this task setting which can be very healthy and fruitful cannot also be overdone. Nevertheless there is no field of manufacturing activity, whether it is purchasing, inventory, efficiency of labour, overheads, investments, which does not admit of higher tasks being set and achieved at any point of time.

IN PURCHASING SHORT-TERM DEMANDS, defective planning, deficiencies in the organisation compel the purchasing department to get materials on terms disadvantageous to the concern; purchasing department knows that if a certain bulk order is sent out at a certain time or times, the most advantageous prices can be secured. This can be set as the standard or task or some intermediate level but something surely better than before. The task setting will very obviously improve the whole system. Similarly the people incharge of stores can fix a standard of stock level based on processing time, work in progress, deliveries, possibilities of getting supplies etc. and can set standards for the inventories to release capital for more profitable investments. Similarly with regard to efficiency of direct workers, it is not difficult to determine what is possible to attain. Time and methods study department can do it reasonably well. If workers are unable to do their best because of defective outlay or process, the deficiencies should be removed. Yet it would be

possible for workers as they acquire more experience to increase their output, improve its quality, reduce rejection rate etc. More costly than direct labour is, in a sense, indirect labour involved in typing, accounts, recruitment etc. The only way of instituting task setting regarding indirect work is to continuously lower the percentage of indirects to direct, in other words adding progressively less indirects and direct. Otherwise, overheads go on progressively increasing whereas there should be a reduction in the unit cost of overheads with increase in the volume of work turned out by the concern. The economies of large scale essentially consist in the spread of overheads over a larger and larger volumes. There should be also task setting with regard to long-term assets such as buildings, machinery etc. It may be possible to take out a larger volume of work out of the existing investment through multiple shifts, improved management etc.

That there are limitations to task setting, it is really not necessary to say. Management has to be particularly careful to ensure that

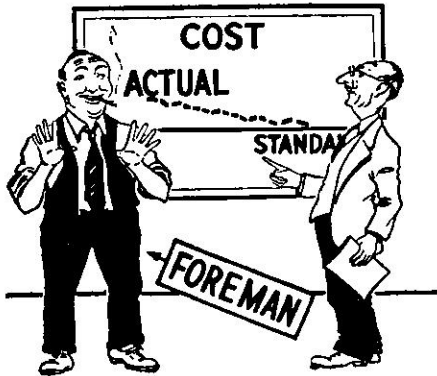
*Cost Accountant, Philips India Ltd., Poona.

they do not contemplate impossibilities. Different functionaries should get a reasonable chance to achieve the set tasks. If the task setting, as introduced, is incapable of being achieved and would eventually result in very wide variances, the incentive to achieve standards will be lost. Besides there will be

psychological resistances all along the wrong line. It is, therefore, necessary for task setting that it should be settled by discussion and agreement. Pre-discussions with different levels of management will boost up the morale and result in healthy collaboration to achieve desired ends.

HOW FOREMEN CAN CONTROL COSTS

Measure Results



FAILURE TO FOLLOW UP



Cost Control in the Indian Economy

RR Sen Sarma*

IT IS ESSENTIAL TO ENFORCE COST CONTROL in the Indian Economy particularly in the manufacturing trades because the root cause of the failure of export trade to expand is the incompetitive cost price structure. Cost reduction has to be achieved alongside improvement in quality. Apart from the necessities of export expansion, the continuous increase in cost in the post-war period—wages, raw materials, services etc.—necessitate cost reduction as an essential element in managerial control. Management ought to have knowledge of the various factors that affect the inflow and outflow of money. In detail the manager must know what and who is responsible for adverse trends, what has really happened, what effect the adverse trend is likely to have on various elements in the cost of production. Further it is incumbent on a manager to exercise control over current costs *before* and *not* after the fact. Application of brakes however careful steering, is not the whole of budgetary control. It is insufficiently realised that cost and budgetary control really involve planning. An accounting statement is really only an expression of a complete plan of management; and this plan is so designed as to take full advantage of favourable circumstances and offsetting unfavourable developments. This system of cost and budgetary control is applicable everywhere whether it is the public sector or the private sector and it has necessarily to be applied at the place and time where cost originates.

It is necessary to reiterate certain commonsense principles for it is no use wasting resources on variances which are insigni-

ficant or unimportant or non-recurrent or outside the control of management. Probably it is worthwhile, going over the various causes of variances: I. *Material*: (i) *price variance due to* (1) changes in market prices, (2) improper purchasing policy: (a) wrong quantity buying and (b) wrong quality buying; (ii) *usage variances due to* (1) changes in design of product, machinery and tools, (2) excess spoilage, (3) rigid inspection, (4) damages during handling, (5) losses in storage. II. *Labour*: (i) *rate variance due to* (1) changes in wage structure, (2) introduction of incentive bonus, (3) changes in grade of labour used; (ii) *efficiency variance due to* (1) wage incentive plan, (2) changes in design of product, materials and method, (3) labour turnover, (4) training of worker, (5) unwillingness of the worker to give best i.e., slow down; (iii) *utilisation variance due to* (1) employees waiting for work, (2) avoidable machine breakdown, (3) want of tools, (4) want of worker due to absenteeism (5) decrease in customers' demand, (6) excess plant capacity.

While the knowledge of variances detailed above would help, it appears most important to emphasise the human element in cost control. Unless there is enthusiasm and cooperation among those who are spending rupee, the pretty little can be done in respect of cost reduction. Further we must rule out the police methods. If a foreman fails to achieve the standard it is not necessary always to punish him. We must in the first instance understand and remove his difficulties and hurdles. If an employee does better than expected, he should be rewarded and encouraged to do it better. Further, there must be education for cost control. ●

* Cost Accountant, Indian Cable Co Ltd, Jamshedpur

The New Way to Net Profits

The New Way to Net Profits is a book written by Mr SW Shibley, Vice President of the Bankers Trust, New York. It is interesting to read what this experienced banker has written about budgetary control in this rather intriguing book.

THERE IS A SECRET GOLD MINE IN BUDGETARY Control which a select few have discovered and are mining profitably. *A budget is not only a money-maker, but the greatest money-saver ever discovered.* I like to tell what Budgetary Control has accomplished under my observation. I have seen the stock of one corporation reduced from 170 million dollars to less than 90 million dollars, and a larger business done on the smaller stock. I have seen stock turnover in several large corporations not only doubled but quadrupled. I have seen a stock turnover of four times a year increased in a single year to thirteen times. I have seen a corporation so hopelessly involved in 1921 that its bankers dared not let it go into bankruptcy, pull out under a new management and Budgetary Control so that it paid all its debts in 1925, and earned better than 10 percent on its common stock. I have seen a company so heavily indebted to the banks that its stock-holders threw up their hands, requested the banks to secure new management and attempt to save a portion of their equity, transformed into a most successful operating company in less than two years, by efficient management and Budgetary Control, with money on hand at the present moment to retire all its banking indebtedness. I have seen a corporation which lost \$ 29,000,000 in three years prior to 1924, transformed into a successful corporation earning in 1925 about \$2,000,000, simply by the injection of a new president and Budgetary Control.

The banker is bound to respect and esteem the Budgetary System. He feels altogether more confidence in a customer who knows

all the time where he stands and where he is going than in one who moves forward without plan or forecast, simply doing the best he knows how.

Nor is this experience confined to America. In an article "What British Business expects of Budgetary Control", Mr Robert Ashworth, *Controller of Electric & Musical Industries Ltd., England*, said :

The general experience of the many well-managed concerns in Great Britain which are employing budgetary control is that (i) it provides an effective means of controlling all activities, including those of executives, and at the same time is sufficiently flexible not to hamper business (ii) it gives directors a useful basis upon which to build their policy (iii) it forms a useful means of communicating company policy (iv) it directs attention to the full economic use of the capital employed in the business (v) it fosters coordination of the efforts of the whole organisation (vi) it breeds cooperation (vii) it saves loss through wastage and leakage.

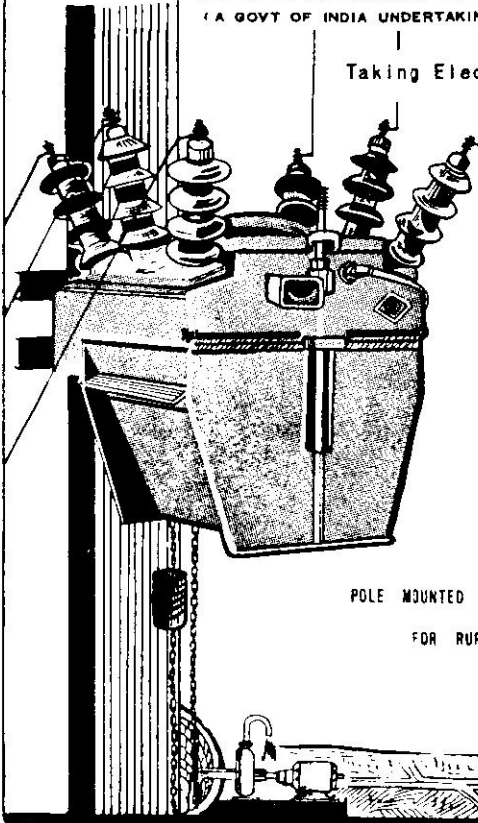
Nor can the accountant be blind to its advance, because, like all else in business, results are finally interpreted in accounting terms and upon the accountant will fall, in the majority of cases, the duty of directing the initial installation of budgetary procedure. Recognition of this fact can be seen in the tendency to include budgetary control as part of the curriculum at least of post-graduate accountancy courses. It is confidently anticipated that a knowledge of budgeting will shortly be necessary in order that the accountant may adequately measure to that larger sphere of accounting service, the scope and pattern of which is only now beginning to take shape. ●●●



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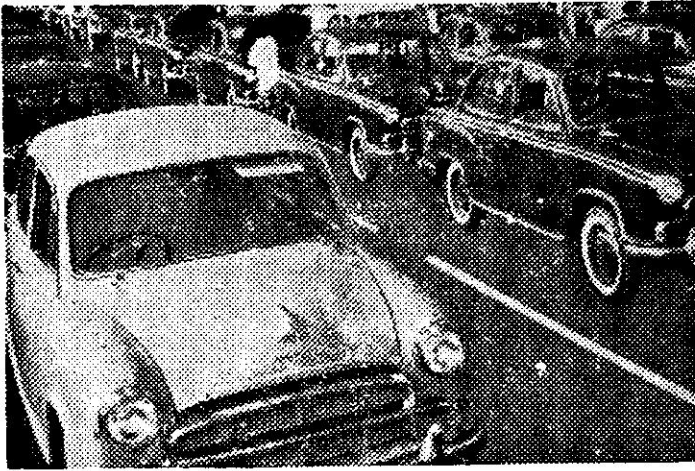
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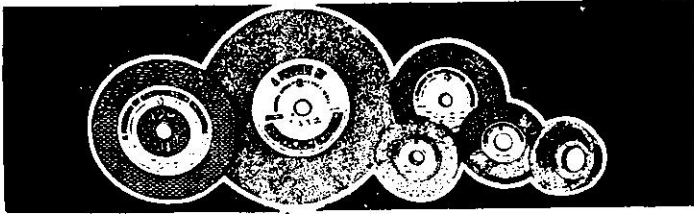
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The Secret of Organization

C Earl Logan*

Management organization consists of three basic elements: Identification and grouping of work, definition and delegation of responsibility and authority, establishment of relationships. Even though the definition sounds simple enough it would lead one to wonder why organization is one of the constant complaints of companies and a major field of endeavour for management consultants.

THE FALLACIES OF ORGANIZATION IN practice are many, but I will mention only a few: (a) Everyone considers himself an expert in organization. All that is required is to broach the subject and a store house of ideas pour forth. (b) It is generally believed that once a beautiful organization chart is drawn, the job is completed for the duration of the Company. Organization is more than a beautiful chart—it is the mechanism through which the management directs, coordinates and controls the business. Hence it is fallacious to think that an organization chart can be lifted from a similar industry or locality and immediately become functional at any given plant.

One of the things management must *not* do is to approach the preparation of an organization chart as if the present set-up were

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Prior to his arrival in India, the author had spent nearly 10 years in the far east and Latin America, in various engineering and executive capacities.

perfect. Just to run down the list of executive jobs and set up connecting lines of authority will give the company an organization chart, but it can never improve the picture or pattern. The preferred method is to make a study of the organization, then set up the chart.

There should be a policy or "roadmap" set up before the organization is formed or a reorganization contemplated. There must be a yardstick for measuring accountability. It must be very clearly understood that an organization or its tool—the chart—is only a means to an end, not an end in itself. If top management does not understand that any organization is in a constant state of flux and is subject to change every time any personnel or production policies or sales methods are changed, then there is bound to be trouble. To bring about good organization one should forget theoretical ideals and accept the fact that personnel is the keynote—the personnel which is available, or can be made available to the firm.

Build an Industrial Community

Anthony Cekota*

The modern industry of today is one of the strongest powers in our life, no matter in what part of the world we live. It produces everything which makes it possible to live as we are living today, and it is only through it that we can hope to have a better life tomorrow. Without it, more than two-thirds of the world's population would not exist, as they have not existed before it. In spite of its importance, modern industry is mishandled and abused in every country, not on purpose (although some people also do it on purpose to disrupt the nation's life), but from inexperience. There are many people who feel that modern industry, being powerful, can take anything and could be handled in any way. The result of this brings not only economic crisis, but especially suffering to the people who are working in the centres of the industrial life, in the factories.

IN EVERY NATION THERE ARE TWO CENTRES of productive life, agriculture and industry, or to put it differently, a village and a factory. I always felt that a really strong and meaningful life would come when people would sincerely try to learn from the experience of others, exchange it and make use of it where they work and live. Long ago, I heard about the life long work and effort of your greatest poet, Rabindranath Tagore, and about his effort to lift up India through education of children and young men in his own village of Santiniketan. For this reason, I went to Santiniketan to see what could be learned there for the improvement of our factory life.

What I found in Tagore's work at Santiniketan was a mighty effort to lift the country up by developing the best human qualities in the men among whom he lived. He knew, as each of us know, especially you, what the problems of this country are. One of them is the 400 million people, of whom 90% are living in villages. You know what these villages look like. You also know the history of India. How—many years ago—this was a country where great things were

done, where great ideas were developed, where art and architecture flourished and where people evidently did such work as was not done in any other part of the world at that time. You could see the inborn skill of the Indian people in the works of art, in ivory, in textiles, in brass-work and in hundreds of other handicrafts. That old tradition could still ease the effect of misery and hopeless suffering. Poet Tagore tried to find an answer to the suffering of his people. For him the answer was how to combine the original spirit of India with the different spirit of the men of the western countries. To him the spirit of India was that of contemplation, thinking, art, enjoyment, consideration of relations between men and men, and the universe. He knew that for centuries the people of India had been ruled by someone else and for that reason tried to escape the harsh realities of life, into dreams and contemplation.

To him the spirit of the west was that of a man who takes nature as a challenge, organises it and eventually directs it towards the development of a more comfortable life. Tagore saw both the advantages and disadvantages of the Indian and Western pattern of life. He believed that some kind

* Director, Bata

of combination of both would benefit India just as much as it would benefit the world. So, that was the poet's reason for his educational experiment by which he actually started the greatest revolution in the uplifting of individual human beings.

In that very remote place, Santiniketan, 140 miles away from Calcutta, where the roads were rough and dusty, he took a few children, mostly orphans and started a novel education system. He did not train them to read and write — nothing of that sort. He put them in one room and first showed them how to take care of themselves, how to prepare their own beds. These beds were very simple, as I found, just a plain board and some sort of bedding or blanket, a pillow and that was all. He taught them how to keep sanitation by digging their own latrines, how to clean the place, how to wash themselves, how to wash the few bits of clothing they had and then how to plant trees and grow vegetables. After they grew a year or two older, out of natural curiosity as human beings they asked for instructions. They received them—not to pass examinations, but to learn reading, writing and arithmetic, as they felt the need for them. They asked for instructions in chemistry in order to know more about fertilizers for their vegetable plots. They asked for instructions in zoology in order to know more about chickens which they kept to get eggs for their meals, and how to handle the cows which gave them milk. All this, they did not learn in the school rooms. He assembled them under the trees. I would have to go a long way narrating what sort of education these youngsters had and what effect it had upon them.

These youngsters get up at 4.15 in the morning and from 4.15 till 9 o'clock in the evening they are continuously busy, either playing or praying or working or learning something. Of course, they have a few hours to rest and sleep during the hottest part of the day.

Tagore found that he could learn a great deal from the children too. He found that in

many instances they helped each other in such a way that the party who helped did not know who did it. He found that there is a *natural decency in men and a desire to cooperate with each other*. He found that the children were full of life. It was not necessary to chase them to do some work or to tell them how to behave with courtesy towards others. If they were inclined to artistry, they just started painting. Thus, Tagore learnt that human nature can be changed if an opportunity for this is given.

These children helped to dig the wells and it is hard to describe with what enthusiasm they finished their first hut. They built simple houses—mud houses, but they were their houses. After Tagore died, the school flourished and his work continued. It has grown up and now provides education up to and including University level.

What kind of young people are growing there? They are alert, tough and healthy. If you would drop them off somewhere in a jungle, they would not be lost, because they know how to help themselves. They are courteous. They are full of energy, and any surplus energy they have, they give it where the need arises. In Santiniketan I realised that this man started something which could change the life of the village and by that, the life of India. There is no power in the world which could lift up hundreds of millions of people if they would not do it themselves. This man, Tagore, found a way how to build up people in such a way that they could help themselves.

While in Santiniketan, I realised how much in common Tagore's education work had with that of another man with whom I worked for several years, Thomas Bata, the founder of our organisation. He also wanted to lift up the life of man by developing a competent individual to work in the industry. And he wanted to build this industry in a factory which would function as a community in which men would voluntarily do their best to help each other.

Now in spite of poverty and all the problems which are existing in the village, you

do not hear very much about serious crises in a village. People are living there peacefully; they know each other; they are surviving and the village is almost indestructible. Life goes on. Not so in the factory. The factory, not only in India, but all over the world, is continuously subjected to crises and strains and stresses. You have labour troubles, industrial unrest, inflation and God knows what else is coming out of the factories everywhere. WHY?

Some of the people who have studied all this for many years, found that the answer to this question "WHY" lies in the fact that *people in the factory have not yet found a way how to establish a community in the factory.* But the factory has a certain purpose in the life of the nation. It has to produce. The factory is not a debating society; it is not a quarrel-room; it is not a Parliament; it is not a University or a School. It has only one purpose—to make shoes, steel, tools, automobiles, machines, that is, most of the things which a civilised nation needs. Such a task, of course, puts the factory and the people in it under certain strain as any cooperative effort must, and under such strain some people do not know how to behave and what is their duty.

In the village when the time comes for the harvest or for the preparation of the fields for sowing or planting people are under strain and very severe strain. Still, they know that they have to face it. But not so in the factory. Strange people coming together under strain start to quarrel and fight and that is the first reason why the factories are in trouble and also the first indication what we should do to avoid our troubles.

Build the factory as a community. While building the factory as a community, you would need to consider the following: Treat people with whom you are working as citizens with all the courtesy, dignity and respect that every citizen is entitled to have. . . In a factory there must be some men who give orders and there are others who have to follow them, but there is a great difference in giving orders and managing the business of the factory in the proper citizenship way and

just in the usual standard business way. While doing your duty, no matter what it is, be aware of it, that here you can start something which Tagore tried to develop in Santiniketan for villages in India—a new type of industrial life in an Indian factory.

In order to build the factory as a community, I recommend the development inside the factory of certain institutions. On such institution is what I call "SELF IMPROVEMENT". Life in industry is much more complicated than agriculture. In agriculture, things are repeating themselves from year to year. The life in industry is continuously changing. What you are doing today is quite different from what you were doing five years ago, and will again be different five years from now. So, change is law in industrial life, and you need to prepare yourself for it.

As men responsible for the factory, have to start purposely some kind of education within the factory and in your free time. Many years ago, I started to try all this in Canada and then gradually I recommended it to many Bata Companies. In some Companies this method has brought interesting and good results. It may help you here too. What is the main idea of such education? Everyone of you are expert in something. For instance, a chemist knows chemistry. A shoe designer knows shoe-making. A mechanic knows his machinery. The idea is that all such men should teach others. Let each of them be an instructor in his field and a student in the other fields. In Canada this was done for nine years now. The result is that there are a number of people, and also young people, who know very much about many fields of our business there. When we were faced with the situation that there were frequent breakdowns in machinery, I thought that it was not sensible to send continuously the maintenance mechanics to fix them. No factory has ever enough mechanics to fix what hundreds of uninstructed operators would damage. Thus, we started to instruct the operators how to keep the machines in order. When the machine would break down, instead of the workers loafing around, the maintenance

mechanic explained to them what the machine was like and how to care for it. Because everybody came to know that the machine could be damaged without proper lubrication, one of the courses was "Lubrication". We wanted not only the mechanics to know it; we wanted everybody to know it. Every foreman is a better foreman if he knows something about shoe-designing as well and so it goes for every skill or profession in the factory.

We know about the natural conflict between the production people and the salesmen. We put together the production and salesmen in a neutral situation provided by a Course. The salesmen taught and explained the problems of sales, whereas the production men taught the salesmen about the problems in production. On the surface of it we thought that it was only material instructions the people gained, but in fact, they gained more, they got mutual confidence and understanding. They have gathered together to collect facts, to learn, to teach and to reason; not to quarrel. Here, they were no juniors or seniors, managers or non-managers. They were just men who exercised their brains and through the continuous exercise of their brains, somehow they acquired deeper understanding of their problems and troubles. When they met again in the factory, there was much better cooperation between all of them. All this you can do here, too.

Life, however, is not the business only. There is much more in life than work and

business, and that is what I have in mind for you to consider, too.

Here, in this country, there are people of great and natural talent in art, dance, music and poetry. This is what I would like you to introduce in your community life. Much of this art has grown in the village life. Behind many of your ceremonies and *pujas* there is always some reason why people get together, either to be happy, or to worship, or to just have a good time and uplift. Why not put it to an industrial place like the factory? For this you do not need permission or money from the top management—you just do it in your own way, because all this, however, you do in your own time. Without this, you cannot get the best quality out of a man.

Actually, you cannot get rid of the troubles arising in the factories unless you start to get the best qualities in men. We, men, are peculiar creatures. *We are neither gods nor beasts, but something in between.* Very easily we can turn into beasts. Somehow, in our time, perhaps due to the two great World Wars, men are being degraded and inhumanised everywhere. All this has affected all of us everywhere. Life cannot be better unless people start to organise their humanity and harnessing the human abilities on the very spot where they live and do it by themselves. Analyse what you have in people here and organise the best and strongest men among them to build up the community from the place you live in. You need it here more than anywhere else.



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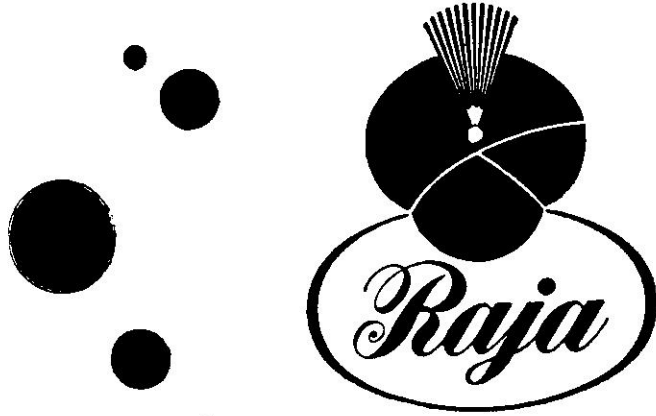
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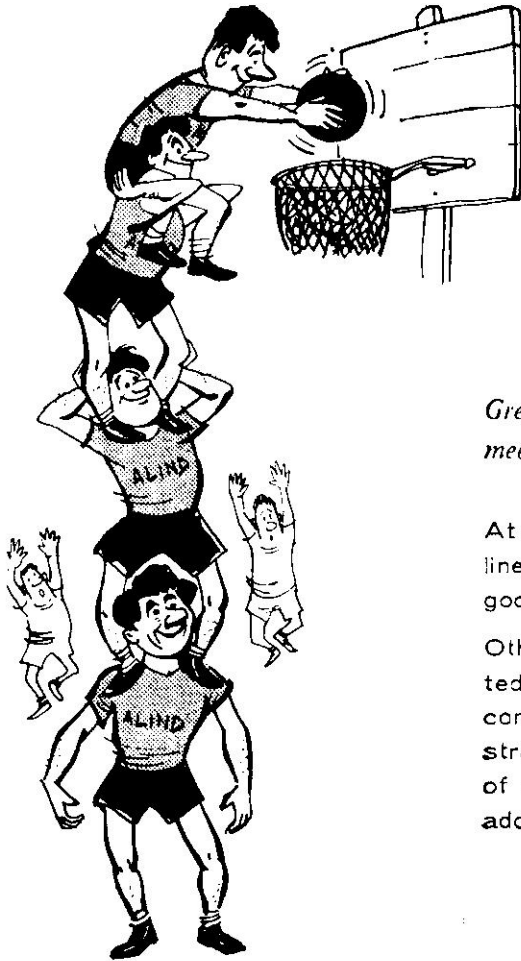
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ARC TIME—a measure of productivity in welding

SV Nadkarni *

IN THE CASE OF SHOPS USING ARC WELDING continuously on a production scale, productivity in arc welding can be measured in terms of "arc time" and "weld deposition rate".

Arc time is the part of the welder's total work time in which the welder's arc is in action. In the case of automatic welding, it is the part of the machine's total operation time in which the machine's arc is in action. Weld deposition rate means the weight of weld metal deposited per hour and its value increases with the diameter of the electrode and the welding current. For maximum welding output the largest diameter of electrode and highest current permissible for the work must be used.

Arc time for manual welding can vary between 60 percent and 20 percent depending on the type of work and the speed with which the job is delivered to the welder. Arc time well above 60 percent is attained by experienced welders in making long continuous butt or fillet welds in the downhand position. An average figure for moderately heavy and large work is approximately 50 percent in the USA and should be 40 percent under Indian tropical conditions. Positional welding will lower the arc time because of the additional strain and fatigue involved. Generally speaking, arc time depends on the type of structure, position of welding, the make-up of the crew, and the

experience and stamina of the welder. The following scale is recommended for gauging productivity in terms of arc time :

<i>Arc time</i>	<i>Grade</i>
60 percent	very good A
50 percent	good B
40 percent	average C
30 percent	low D
20 percent	very low E

Arc time for automatic welding is much higher than for manual welding because the operation of changing the electrode and deslagging a weld run is not involved. Arc time well over 75 percent can usually be maintained with automatic welding machines because they are used for making long, continuous welds in the downhand or horizontal-vertical position without interruption. There are special installations for mass production of items wherein arc time can be as high as 90 percent. Arc time of at least 50 percent must be maintained to justify the high investment cost of the equipment and the high cost of the wire and flux. It has been estimated in the case of a 12.5 mm fillet weld that by reducing the arc time of automatic submerged arc welding from 50 percent to 12 percent, the cost of making the weld becomes the same as with manual welding.

In manual welding there are several insignificant-looking factors which increase the arc time in a given set-up. For example, changing from 14 inches long electrodes to 18 inches long electrodes raises arc time by

* The author is a highly qualified technician at present working as Chief Welding Engineer with JB Advani—Oerlikon Electrodes, Bombay.

3 percent, and this further rises by another 2 percent as a result of increasing melting time from 75 to 100 seconds. Both factors increase the length of arc time between interruptions and thereby the total arc time in a given period.

How can one measure arc time in a shop employing a large number of welders? Some of the leading firms in foreign countries, especially shipyards, have installed special electrical devices which measure up the total arc time of every welder during his entire shift. Some of these devices may work on the following principle : A current relay is kept at the transformer end in the secondary circuit. This relay has normally open contacts which are connected in series with an electric clock of the self-starting type. Each time the welder strikes the electrode the current relay operates and closes contacts for the clock and records the time. At the end of the day one can get total welding time directly from the clock reading. Such devices not only help the management to determine productivity but also to calculate the incentive bonus that may be paid to a welder under an incentive system.

There is a simple and practical way of determining arc time which can be used by any welding shop. It consists of determining by practical test the arc time required for melting an electrode on a given application and finding out the quantity of electrodes consumed by the welder in the shift. To cite an example, a 4 mm dia. 450 mm long rutile type electrode used at 170 amps. in the downhand position requires 100 seconds to melt, leaving a stub of 40 mm. Suppose a welder welding under these conditions has consumed 108 electrodes in one shift. Then his arc time was 108×100

seconds = 3 hours in an 8-hour shift. Therefore the arc time is 37.5 percent.

In this system there is a loophole that the welder may increase the welding current beyond the stipulated limit and consume a larger quantity of electrodes in less time. Then it is quite likely that the welder will discard stubs longer than 40 mm because the electrode gets prematurely hot. So the welder must be asked to produce the quantity of stubs at the end of the day to check how many and how long they are. The welder may, in another instance, use higher currents and at the same time use up the entire electrode even if it gets hot, thus causing bad welds. This eventuality can be met only by checking the melting rate of the electrode on the welder's holder from time to time to make sure that it has not fallen below 100 seconds or whatever value was originally fixed.

A similar system can be followed for automatic welding. For example, an automatic submerged arc welding machine using 4 mm dia. wire at 700 amps. melts down 200 gms of wire per minute or 12 kgs. per hour. If in an 8 hour shift 48 kgs. of wire have been consumed, the arc time has been 50 percent.

Conclusion

It is important for every welding shop to maintain the arc time of every welder as high as possible in the interest of productivity. Fundamentally, obtaining high arc time is based upon good planning, good shop layout, good organisation of the work, efficient operation of fixtures, jigs, machines, etc. combined with good morale on the part of the workmen themselves. An incentive system can contribute tremendously to the maintenance of high arc time and high welding productivity.

“.....as much goodwill may be conveyed in one hearty word as in many.....”

From Charlotte Bronte's Jane Eyre

In Praise of Work Study

SK Lahri*

Work Study is a laborious process of keenly observing and analysing an existing system and finding out ways and means that may make the job consume less capital, space, material, labour, movement and time and/or to ensure a better way of storing at an economic stocklevel, a healthier layout of the workplace, a better quality of product, a better and coordinated rhythm of production between interdependent departments. These are the objectives of Work Study. Work Study does not accept opinions but aims at obtaining the actual facts and figures to help in making the right decision. This is the very foundation of work study. Very often management accepts the opinions of managers and foremen who are too busy to get to the facts of a particular problem. Here are a few interesting cases.

A CERTAIN PLANT HAD A PICKLING DEPARTMENT with 4 pairs of tanks: a pair each containing acid solution, caustic solution, a special solution and water, respectively. Whenever the manager or the foreman visited the department, they found a heap of sheets awaiting pickling. The obvious solution as per their opinion was to have another pickling department. Fortunately "Work Study" was called in before the actual expansion of work.

The first step for the work study man was to find out whether the tanks were really overbusy. With the technique of activity sampling he found that the facts were otherwise. He undertook 1,176 observations out of which 976 showed 'idleness'. After 4 weeks of observations he could emphatically say with 95% confidence that the activity or utilisation ratio was only 17% within the accuracy limit of $\pm 2\%$.

From the multiple activity and simulation chart it was evident that only a crane was overbusy but the tanks were very poorly utilised.

After critical examination of the present operations, the following measures were suggested: (1) the crane or cranes should

be used only for the purpose they are best suited for or to its highest capability that is only to transport or carry the load of sheets and not for standing stationary with the load in suspension and during long periods of loading and unloading (2) cheaper devices or equipment be arranged for holding the sheets in suspension in the tanks (3) two more racks be provided so that when the crane is engaged in carrying one rack-load the other rack may be kept ready, loaded with sheets, in the meantime (4) that the activity charts and simulation charts be drawn for the cranes and all the tanks with minimum "Idle" spaces in these (5) only one crane would be economical and the other crane could be released for other job (6) as a long-term measure, installation of conveyors should be considered.

However as a result of the study, the proposal to spend on an extra pickling department was dropped.

A Study of Railway Engines

Here is an interesting case on "Layout". The traffic department in a big plant had to deal with incoming trains of wagons containing two or three different items of materials. A typical train would consist of two groups of wagons—one group to be left at the siding

*Deputy Director, NPC, Calcutta.

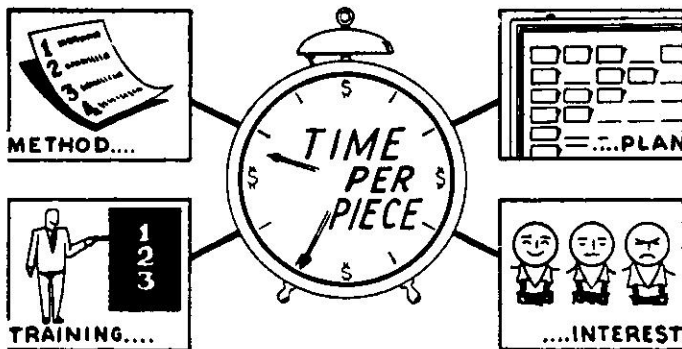
and the other group to be kept at the wagon tippler. The engines were working most of the time but the amount of work performed was much below the daily requirement. There were opinions in favour of securing extra engines. By keen observation and recording of the movements of the engine and subsequent examination of these movements over a considerable period Work Study found out that the engine was in fact busy or engaged 90% of the working time but only 25% was on productive business, reckoned from placing the first group of wagons disconnecting and taking the other group to the tippler. The train, instead of having a uni-directional or forward motion only, had to move up and down long distances before the start of the productive business. Reducing the number of wagons per train being unacceptable, immediate improvement was possible just by shifting the point-crossing.

Here is a very simple and typical case

which we come across in very many plants even now, where the productivity of a machine can be increased very considerably by a negligible expenditure. Thus just by providing a duplicate dog or carrier, the time for turning a pin on centres on an engine lathe could be reduced to 15 secs in place of 23 secs. The same principle should be profitably applied wherever the activity charts justify it, as for example on drilling, milling and other operations where only one small or cheap fixture is in use.

In many organisations a Mock-Work Study is carried out mentally by a few persons gifted with special intelligence and foresight without having the correct information at their disposal. On the other hand decisions based on physical and methodical Work Study that is on exact facts and figures and their systematic critical examination is usually reliable and productive.

ALL I DO IS CHANGE SETUPS



Work Study ?

EFL Brech*

There has been some confusion in industry and in technical literature dealing with the measurement of work and payment by results, because of the indiscriminate use of terms like time study, motion study, micro motion study, dynamic motion study, rate-fixing, time setting and so on. And because the more generally used term, time study, has been associated with attempts by untrained persons to do ratefixing rather more accurately, and has occasionally been misused by shortsighted or impetuous managements, it has come to mean to some, particularly organised labour, *something synonymous with speeding up, etc.*

THE GENERAL PROCESS OF WORK STUDY has been going on since man first thought of the wheel and cart to save him carrying loads himself. What is relatively new is the emphasis given to the time aspect of work study. *Engineers in particular have always been interested in better ways of doing things, and the present industrial civilisation is the result of finding better and quicker ways of doing them. We have, however, mainly concentrated on designing equipment and mechanisms. It is only in recent years that men, chiefly engineers, have studied the ways men do the jobs that men, and not machines, must do.*

It is possible to say now with reasonable accuracy exactly how many parts an automatic machine will produce per hour; the designer or machine-setter can state precisely the rate of output of, for example, a cigarette-making machine, an automatic machine producing screws, a printing machine or an automatic loom on a given weave. But how many articles will be produced in a day or a week in a given factory; how many looms or automatic screw machines can an operator look after, and how many cigarettes can be made by hand per hour, chocolates wrapped, orders packed, or customers served in a department store? You

will notice that *the question is, how many can, not how many are.* The answer to these questions can only be obtained with any degree of accuracy by studying the work being done, at the time it is done, the effort required, and the skill of the operators, and including in the study the conditions under which it is or may be done, and delays that may occur. It is not sufficient to take an average of part performance, to ask the operator or the foreman, or to take a spot check. That may tell us how many are being done, either the maximum, minimum, or anywhere in between, but *it will not tell us how many can be done. Only work study can do that.*

Furthermore, there are *few methods of doing jobs which cannot be improved upon*, however much they have been developed and however well they are being done today. New materials, new techniques, new equipment are being developed continually. Filling powder by scoop or chute was a slow as well as a dusty job until someone studying the dust problem remembered that fluids are filled by vacuum; insulation materials were cut by hand with scissors until someone studying how to increase production remembered how printers cut paper and cardboard to shape. *Unexpected, and often substantial improvements in output can frequently be obtained by objectively studying the way work is*

*Senior Consultant, Urwick Orr Ltd.

done with the aim of finding what is the best and quickest way to do it.

Gilbreth, the pioneer of motion study, who devoted the greater part of his career to the search for 'the one best way to do work', was able quite early in his search to eliminate unnecessary movement and effort from brick-laying in the USA, and obtained outputs, *without undue fatigue*, which trade union brick-layers in England considered impossible even nearly fifty years later. Gilbreth's men, who had formerly worked to their limit to lay 1,000 bricks per day, were able, after a short period of instruction, to reach a daily output of 2,700. The daily approved output in England today is somewhere between 400 and 800 !

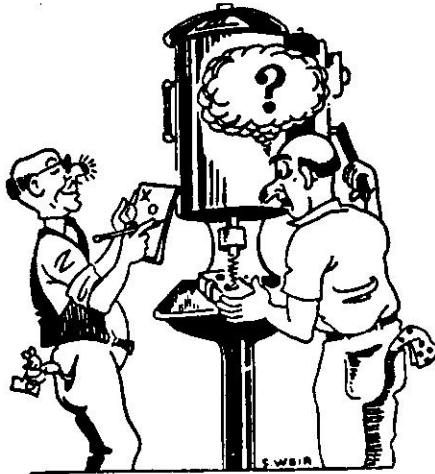
Time Study is used synonymously with the more general and descriptive term work study. As carried out quite frequently, however, time study has a more limited aim, namely, that of finding the correct time for a job as at present being performed.

Motion study directs emphasis on to the study of bodily movements, and is most intensively developed in mass production or continuously repetitive production. This study of bodily movements is fundamental to all work study, but *the neglect of the other factors involved in doing work, that is, environment and administration, by those engaged on motion study has warped their conclusions and judgment on its value and equity* by those concerned.

"*Motion study has been very much misunderstood. Possibly, some responsibility for this attaches to the Gilbreth's own definition of their quest—'the one best way to do work.'* They have been misinterpreted as seeking to tie the worker to a monotonous repetitive round in his daily task, although their *only field of interest was to make movement simple and economical.* It is too often forgotten that *the study calls, not only for an analysis of motions, but also—and to an equally important extent—for an analysis of the environment in which the work is being carried out.* In short, *motion study calls for a complete analysis of the whole job with all its attendant circumstances.* When it is regarded thus in its proper light, the criticism of motion study becomes meaningless."*

*The Making of Scientific Management, Vol. I, by Urwick and Brech, page 141.

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A Model Work Study Centre

JG Reid*

The Wool Working Party suggested the setting up of a Work Study Centre. The Wool and Allied Textile Employers' Council, after considerable planning and deliberation set up the Centre in early 1954. Its working reported below shows what an amount of work, a Work Study Centre can possibly do. Further, what is more significant, the Centre earns sufficiently to cover all operating costs for the first three years, some additional grant was obtained on a diminishing scale from the Ministry of Labour. The demand for its services is increasing, and today the Centre employs a total consulting and instructing staff of 18 persons. It is extending to the Scottish Wool Textile Industry and the hosiery firms of the Midland. It is of course hard to measure the benefits which Work Study has brought to the industry but it has been estimated that the cost in savings due to the improvements carried out at the instance of the Centre might well be in the region of Pound one million. The handicap of shortage of labour from which the textile industry has been suffering has been well met through Work Study techniques. The Centre has also helped industry to work out an appropriate figure for Work Study Organisation: one Work Study Engineer to 400 employees (excluding management and office personnel). This compares with about 1 to 100 in some other industries. However, the nature of the industry with its relatively unchanging methods and processes, together with an absence generally of middle management specialists, means that this ratio is not too unprogressive.

NOT ONLY THE MANAGERS OF FIRMS AND their officers have benefited from the training courses in Work Study run by the Centre but labour unions have also greatly benefited. The National Association of Unions in the Textile Trades (NAUTT) has had two of its full-time officers trained on the ten-week main course. These officers have returned to special duties in the Union where they could advise on the application of work study to the textile processes as it affected their members. Recently a short course for all the full-time officers of the Union was held at the Centre in order to give them a wider understanding of these techniques.

After the first year of running courses the Centre was approached by firms to provide a consultancy service whereby members of

its staff were assigned to specific projects in the mills. The demand for this service has continued to grow at a considerable rate and the types of assignment have covered nearly all aspects of production management. Problems involving re-layout of departments, the economics of requirement together with improvement of methods employed by individual operatives have been tackled. In addition, many aspects of production planning have been studied together with labour redeployment and the installation of incentives bases on Work Study.

In addition, the Centre has actually carried out a number of Work Study investigations on the shop floor: (i) An investigation into the use of work study for a more accurate determination of workloads and as a basis for a sounder incentive in weaving has been carried out over the past 18 months on behalf of the Joint Advisory Committee on Production, representing both the em-

*Wool (and Allied) Textile Employers' Council, Bedford.

employers and trade unions in the industry. (ii) Fully fashioned stocking production: an investigation into working conditions and workloads during the operation of fully fashioned stocking knitting machines has been carried out for the National Joint Industrial Council of the hosiery industry. A new concept of relating workload to target earnings is being evolved.

The primary aim of the Work Study Centre is of course to train Work Study technicians. It should not be thought, however, that Work Study is purely and simply a specialist function. The outlook and methods which it embodies can be applied to industrial organisation in its broadest form. It is for this reason that many firms have found that training in Work Study has an important contribution to make to training in managements itself.

One application of special value to management in the normal running of a factory is the establishment of reliable standards for labour control. Accurate information summaries are then made available to management giving a clear

picture of departmental or factory performance and analysing the reasons for any divergence from standard.

Work Study is most effective when it receives sympathetic and informed support from senior management. The Work Study Centre attempts to answer this problem by providing as an integral part of its service, covered by the single fee, an appreciation of Work Study for senior management which is held on a day in the latter part of the course at the convenience of those attending.

A problem often experienced by the smaller firm is that of sparing a man from his duties within the organisation to undergo a ten weeks period of training. Many firms have faced this problem squarely and have found that even the most indispensable member of their staff could, with some forethought, be relieved for a period. In several cases firms have engaged a suitable man for training and subsequent Work Study duties. If an employer would like to have advice before hand to help in selecting a suitable man for training, the Principal of the Work Study Centre is always glad to assist.



The man on your time

An Interesting Case Study

SP Sirkar*

The author ** of this article has worked out an extremely interesting case study : in a situation of expanding, highly profitable market which could absorb 60 percent more than the normal output, the establishment of a plant manufacturing clay products was faced with two alternatives, either to make a substantial additional investment or explore the possibility of the utilisation of existing equipment to meet the increasing demand. What the plant required was 60 percent more clay of suitable strength, plasticity and quality. They had a grinding mill with two wet pans; the supervisor put in a request for the installation of a third wet pan to meet the increased demand on plant capacity. The manager decided to have a methods study made in order to determine whether through fuller utilisation of the existing wet pans, the establishment could 'save' the money required for additional investment; and Work Study gave an affirmative answer.

METHODS STUDY WAS UNDERTAKEN (a) to assess the potential productive capacity of the existing two wet pans (b) to determine their utilisation and (c) to suggest ways and means for improving operating efficiency. It was observed that the two pans were of different sizes and operating characteristics. Usually the bigger pan, although installed much earlier, was found to be operating most of the time and the smaller pan was kept as a standby being used only in emergencies, such as breakdown of the bigger pan. An operating crew of five men used to get raw materials—silica rocks (ganister), clay and old materials reclaimed after use and charge the same manually by shovels into the pan, open tap to add the mix, operate the machine for mixing and grinding, till the mud of required plasticity and strength was obtained. Then it was removed and filled into standard steel boxes, manually.

The determination of pan capacity was

a rather complex matter depending upon design construction and operating functions : size of the pan; weight of molars; speed of rotation of the pan; quantity of material which the pan could take; friability, feed and size of the raw material etc. Here a confession must be made, for there is an impression that determination of plant capacity is an absolute, scientific, mathematical calculation. Actually plant capacity is decided by trial and error; it is a matter of experience, good judgement and the like, for these alone can determine the ideal feed under the actual circumstances. Evidently the capacity of the pans varied within very wide limits; and it is here that Methods Study helped a good deal. We had to determine the maximum production capacity of the pans and their optimum production capacity. The calculated maximum productive capacity is theoretical and is rather difficult to obtain in practice due to interruptions of the equipment due to various causes such as unavoidable delays for set up and repairs, power failures, shut downs for greasing and oiling the availability of the crane facilities etc. All these interruptions reduce the theoretical maximum value. After an analysis of these

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** The author desires to express his gratefulness to Sri VS Vernekar, Chief Industrial Engineer, TISCO, for his valuable guidance in this case study.

delays, the practical productive capacity was fixed at about 70% of the theoretical optimum capacity.

Statistical analysis was made of the available records during the period of six months and we found out that the equipment utilisation was 53.5 percent. The entire operation was resolved into various elements and these were studied separately to locate the bottlenecks. The results are recorded below :

(a) *Pan number 1* : Equipment utilisation was found to be low because of poor machine usability. The machine was having break downs on account of troubles in molar bearings wearing out of moving parts, necessitating frequent attention for maintenance. The obvious mechanical defects were pointed out and were remedied. Simple redesign and replacement of some parts were recommended. On implementation of those recommendations, the pan was found to render trouble-free service and thereby higher availability was achieved.

(b) *Pan number 2* : This was not giving satisfactory service since its installation. It was purchased purely to serve as a standby and therefore it was run sparingly. Consequently, due attention was not paid in the past to ensure its smooth operation. This machine should have been otherwise of the same capacity, as Pan number 1.

It was certainly possible to make a fuller utilisation of pan number 2, after making the changes detailed below : (i) *Motor Horse Power* : The HP of the motor for number 2 Pan was found to be inadequate for the workload the pan was supposed to carry out. By a comparison with the standard value given under the table in 'Factory Design and Equipment & Manufacture of Clay Wares' by Mr TN Garve, it was found that a 70 HP motor would be required for the purpose, instead of the 40 HP one supplied with the machine. (ii) *Lubrication System* : The products of the wet pan were found to be spilling over the inner brim of the pan into the bottom thrust bearing, which resulted in jamming the bearing and stalling the motor,

A cover to protect the bearing from the dirt and a steel tube leading from the bearing upto the side stand with a grease cup to serve as a lubrication point, were suggested.

(c) *Layout* : A scientific layout was developed and it was proposed to reposition the 8 feet diameter pan. This enabled one gang of operating crew to attend to both the pans working simultaneously and also ensured an organised flow of work for other processes being performed in the same building.

(d) *Materials Handling* : The materials handling methods were crude, manual and costly. Inexpensive but simple mechanised methods were developed and recommended :

(i) *Feed* : The elimination of manual labour and shovel could be possible by installing an overhead storage bin and a gravity fed chute running from the storage bin direct to the pan. Automatic feeder could be so adjusted that it delivered the correct amount of material to the pan. A disc type of feeder was recommended for the purpose. (ii) *Delivery* : Removing 'mud' (product) from the pan manually was considered to be wasteful of time and effort. A very simple mechanism such as a guide fitted to the existing shovel on the pan itself would automatically guide the mud out into the box as the shovel was dipped into the pan.

The results of this methods study are extremely interesting. We found that with these improved methods, we could obtain the required quantity of clay by working pan number 1 in two shifts of eight hours each. Number 2 pan alone also could produce almost the entire requirement in 24 hours but it would have to be marginally supplemented by working pan number 1 for an hour only. In case the management decided to work both the pans simultaneously, the whole requirement could be obtained through the two pans in 10 hours, as against 18.6 hours at the current level of actual performance : a saving in time of 46 percent, not to mention the saving of a hundred thousand rupees which was the additional investment proposed.



Work Study & Communication

Thomas Fassam*

Communication training on work study courses has to be severely functional in character for two reasons : one, the amount of time that can be spared is limited and two, the application of the work study approach to the subject should remove any extraneous matter. *The work study man cannot waste time on ornamental flourishes*; his communication must be efficient, since the whole success of his application of work study depends in the last analysis on whether the people affected are going to accept his findings.

ASSUMING THAT THE WORK STUDY MAN depends for his success upon the right handling of human factors involved in his work, we see that he has two main communication problems :

- (a) how to create an atmosphere of cooperation in communicating 'downward' so that supervision and operatives turn naturally to him for answers to their questions, knowing that he understands their hopes and fears and will tell the truth.
- (b) how to create an atmosphere of confidence in communicating "upward" so that higher management will readily understand what is recommended and why.

These two basic situations involve some training in the informal communication of discussion and explanation on the one hand, and the formal communication of submitting written reports on the other.

To teach the art of cooperative conversation by individual practice would

take a long time. In work study training the problem is to find some quick and effective means of laying before the students the issues involved in verbal communication. It has been found that the most economical procedure in time and effort is to present an 'open-ended' problem in the form of a brief film strip, with a sound recording giving a standard narrative of the problem.

Discussion of the problem occupies about an hour and solutions are sought at two levels : (i) how could this situation have been avoided and (ii) how should it be dealt with ? According to the level of intelligence and the degree of acceptance for the method, a second hour may be spent :

- (a) by role playing the solution, recording this part of the session and analysing the playback;
- (b) by a more theoretical approach, *e.g.* tabulating the group's views on *what people seek in work and the extent to which work study satisfies or frustrates these expectations*;
- (c) *ad hoc* discussion of particular points that seem to trouble the group, *e.g.* redundancy.

*Head of Intelligence, Central Work Study Department, Imperial Chemical Industries, London.

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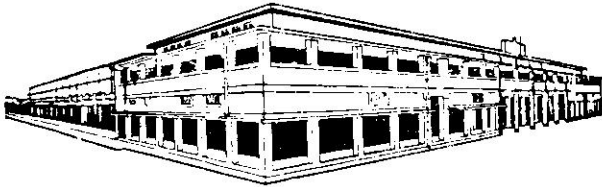
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Question Answer Service

Manning for Maintenance in Steel Plant

Question: **How is manning for maintenance done? I would like the answer with reference to a steel plant. Please mention the American practice if possible.**

TWO NPC EXPERTS HAVE GIVEN THE ANSWERS PRINTED BELOW.

(A) There can be no single answer to the question posed; and American practice also is variable, even in steel mills. However a typical organization arrangement is shown on the chart (next page). Here a group of 55 craftsmen are used in a metal-fabricating or metal processing plant. A group of craftsmen of this nature could be expected to approximate 5 to 10% of the hourly wage roll. . . The exact requirements of much of the maintenance work should be based on a preventive-maintenance system. This permits man hours required to be closely estimated and schedules may be drawn up for a large portion of the work done.

The Technical Inquiry Service of the National Productivity Council will provide those interested with certain publications in this field for a nominal cost. Among these are: (i) "An easy way to set up Maintenance & Job Standards"—Digest D-8961, Price Rs. 2/-. (ii) "Bibliography of Plant Maintenance"—IR 21437, Price Rs. 2/-. (iii) Technical Bulletin No. 26: "Maintenance Training Programme"—Price Rs. 2.20.

Those interested in more details on this subject may refer to the above-mentioned items, and write to Technical Inquiry Service, National Productivity Council, 156-Golf Links, New Delhi-3.

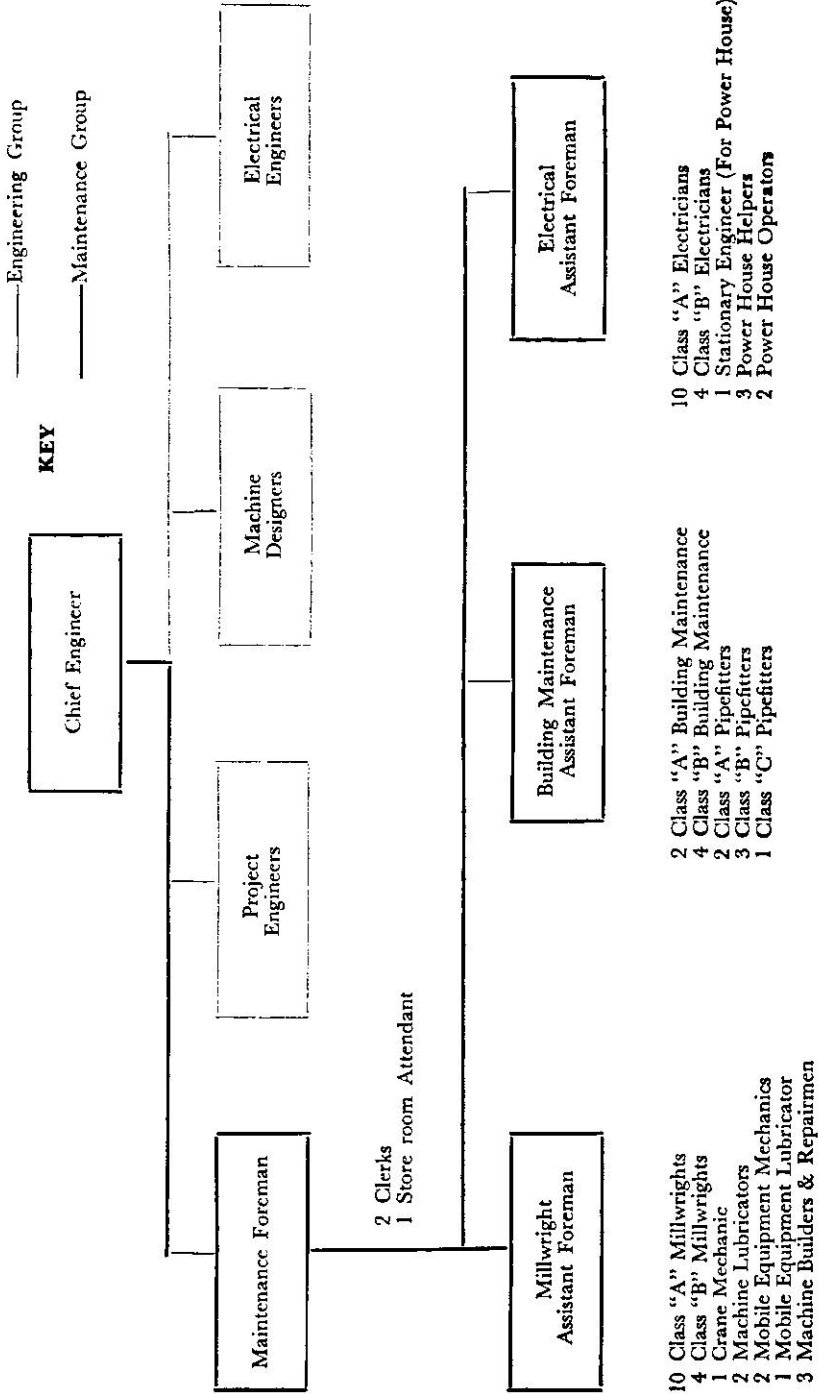
—RF Bruckart*

(B) The General Procedures for determining the maintenance man power requirements for steel mills are of little difference from those used in other plants. The first basic consideration is the type of scheduled operation, i.e., 5 days—2 shifts, 6 days—3 shifts or 7 days—1 shift. This will determine when and how the maintenance, other than routine, must be done.

The second step is to make a breakdown and divide the jobs to be performed into those commonly known as preventive, i.e., lubrication, inspection and adjustment, and minor running repairs. We also should estimate the major repairs, replacement of parts and emergency repairs. Maintenance operations falling in the first category (preventive) can be best determined by a study of the machine manufacturers' recommendations for lubricating, adjustment and inspections. The development of an estimated man-hours can serve as a guide for basic starting crews. Major maintenance operations falling into

* Industrial Engineering Consultant, National Productivity Council of India.

Organization of Plant Engineering Department
 Showing Crafts and Personnel in Maintenance Section



the second group can best be estimated by contacting the machine builders for lists of fast moving repair parts and experience of others on similar equipment adjusted to our operating conditions and estimating the man-hours.

The third step is to determine what crafts or skills will be required i.e., Does the equipment have electronic controls? If so, we must provide for trained electronic controls maintenance. It's quite possible that just any electrician won't do. Further evaluation must be made to determine what services are locally available, on call, on contract from outside sources, i.e, if there should be an abundance of carpenters in the locality there's little point in building up a staff of carpenters. A fourth consideration is what part the maintenance crew will play in new construction or machine installation as additional manpower must be provided for this activity.

Assuming the maintenance department is in operation; by applying suggested steps one, two, three and four, we then will be in a position to conduct work sampling studies to determine the manpower requirement for each type of maintenance and craft. A rule of the thumb check can be done by considering the installed value of the equipment at today's prices. The annual cost of maintenance should run from 7 to 15 percent of the equipment value in the plant.

Building maintenance should run from 1½ to 3 percent of the building investment. Direct labour costs exclusive of overhead will run 30 to 50 percent of the total maintenance bill. If new construction and alterations are to be included in the maintenance departments responsibilities about a 10 to 20 percent larger maintenance force must be included in those crafts affected.

—KC Jasper*

*Senior Management Consultant, George Fry Team attached to National Productivity Council of India.



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Letter to Editor

PRODUCTION OF FOREMAN-MANAGERS

Your idea of designating proprietor of a small industry as his own Foreman-Manager is quite appropriate (*published in the leading article of Vol. 3 No. 5 & 6*). In this connection I may make a reference to the success of Scientific Management which ensures intimacy of management with daily progress of work along with workers. Further experiences since then only go to confirm your views on this subject.

Whether the Foreman-Manager is a proprietor of a small industry or the headman of a section in a big enterprise, his functions as the most important keyman in the nation's industrial development will remain the same. It is he who will give products as defined by the Planners and it is he who will give reliable information for improving his plant and tools, deciding specifications of raw materials, fixation of operational and maintenance standards for cost and quality control, training and wages of workers. In short he will shoulder full responsibility in all aspects of his industry or section. So the problem is how you will produce such men in sufficient numbers. Perhaps the problem becomes easier to solve if primary emphasis in industrial life is stressed on results required rather than on degrees, on originality rather than on imitation, on grasp of fundamentals rather than on far-fetched and un-related matters, on constructive and cooperative approach rather than on arrogance and bluff, on economics rather than on technocracy of a technical circus!

SRI RAM AGARWALA (BHILAI)

Special Issues

of

The NPC PRODUCTIVITY Journal

NPC gratefully acknowledges the general appreciation accorded to the special issues on Incentives, Personnel Management, Measurement of Productivity, Work Study, Quality Control, Materials Handling and Small Scale Industry. The next two issues will have sections devoted entirely to Operations Research and Productivity and the Worker.

The editor invites all who have special experience of these lines to send in their best contributions as early as possible in any case not later than 1 February 1963 for the special issue on Operations Research, and not later than 1 April 1963 for the one on Productivity and the Worker.

Articles may be as brief as possible (1000 to 2000 words) expressing in as compressed a form as possible the writer's own ideas, experiences and readings in the line, should be illustrated with significant photographs, drawings, cartoons etc.

Recent Literature on Productivity

SOUTH INDIA TEXTILE RESEARCH ASSOCIATION: **Proceedings of the Fourth Human Relations Conference**, Coimbatore, 1962, pages 135.

THE SOUTH INDIA TEXTILE RESEARCH ASSOCIATION recently held its fourth Conference on Human Relations in Industry. The Report of its proceedings is really a landmark in industrial psychology and should be treated as a very valuable contribution to productivity literature. The following words extracted from the welcome address of Sri K Srinivasan, Director of SITRA, give an idea of the approach of SITRA as also of the importance of its Conferences on Human Relations: "One of the jobs we are constantly doing in SITRA is to evaluate our own work in terms of furthering academic knowledge as well as in terms of the usefulness of that knowledge to the industry... 130 organisations were represented at our last Conference... Trade Union participation has been on the increase from year to year... During the last few years we have been able to create an awareness of the importance of human relations in industry. I would like to point out that *the habit of cooperation is just as catching as measles or chicken pox*... The studies conducted by SITRA have helped in a better understanding of some of the psychological problems in industry. These studies have also unearthed some problems that we did not know have existed..." Sri GK Devarajulu, Chairman of SITRA, drew the attention of the Conference to the possible impact of science and technology on Indian life "...introduction of technological changes must be carried out with due regard to their social implications and individual necessities. If that were so, resistance to change will be minimised and technical progress will be smooth and rapid..."

Prof. Humayun Kabir, our Minister for Scientific Research and Cultural Relations in the Government of India, inaugurating the Conference, related a number of significant stories in the history of technological development: "...When Gladstone came to Faraday's laboratory, he asked with some surprise: 'Mr Faraday, why are you playing with these little things? What earthly use has this electricity?'"... After the Second World War, American General Staff undertook a very elaborate analysis of the causes of Hitler's defeat... Hitler started with tremendous advantages. He had the inner lines of communication, a more compact area and his resources were also more or less within his own control. According to the analysis of the American General Staff, one of the major reasons for the defeat of Hitler was misunderstanding at every level of what the High Command intended. This was due to the fact that even when people did not understand, they carried out the orders. In a democracy, when you do not understand, you ask: 'What is it that you mean?' 'What is your intention?' 'What am I expected to do?' In a dictatorship, one dare not ask that question, because 'what do you mean' may be interpreted as implicit criticism. It is a polite way of saying that 'what you mean is not correct, change it'

In the course of his address Sri Humayun Kabir made a deep analysis of the basic causes of inefficiency. In his opinion, corruption is among the primary causes of low productivity. Sri Kabir's analysis is worth pondering over: "To my mind, the problem of corruption is essentially a problem of leadership. Corruption has its origin when inefficient persons get to the top through extraneous circumstances. There is no more basic cause of corruption than inefficient leadership... Corruption means friction. *In all relations of human beings, the best and basic lubricant is a sense of justice*... Heredity is being

gradually eliminated in politics... In industry and commerce also, we must dilute the principle of heredity. We are today getting in the ranks of captains of industry, people who are coming up by merit and character. But the hereditary principle is still stronger here than in many of the advanced industrial countries of the West. I think, the sooner we conform to those standards the greater will be the gain from the point of view of human relations."

The Report contains, besides these speeches, a number of excellent papers read by outstanding experts, supplemented by a set of extremely rich case studies. This Report therefore should not be catalogued with many other reports with which the market is currently flooded.

MOHNOT, DR SR, **the plans : progress and portents**, published by the Bureau of Economic Studies, Calcutta, 1962, price Rs. 3.75, pages 117.

IN A SERIES OF ESSAYS WRITTEN ORIGINALLY AS talks for broadcast from the AIR, the author has subjected the whole course of economic planning in this country to a close analysis, generally critical, but on the whole, favourable and balanced. The historical background has been critically presented in the chapter on the Economic Philosophy of our Planning. Six chapters have been devoted to a review of economic development from the First Plan to the Draft Third Plan. The structure of Industrial Development has been examined in another seven chapters with particular reference to railways, agriculture, river valley projects etc. The various problems that have come up in the course of economic development have been fairly well examined. The most interesting part however is an Epilogue on the Balance Sheet of Planned Economic Growth where the gains and the losses have been examined in some depth. This is the summing up: "To strike the balance, it might be concluded that the principal objective of accelerated economic growth has been achieved. Notable advances have been made in agricultural production, particularly in the field of commercial crops. A new and revolutionary transformation is taking place in industry with emphasis on large, basic and non-traditional industries. Rates of savings and propensity to invest have increased in the country while consumption levels are, slowly but surely, going up..." The book is worth reading. In a compass of only 117 pages, the author has somehow succeeded to give all that needs to be known about economic programming in this country.

LATIF, TAA, **Sales and Management Training in India**, Indian Chamber of Management Publication, published for the Current Book House at the Examiner Press, Bombay, pages 34, price Rs. 2.00.

THIS BOOK WAS RECEIVED AS WE WERE GOING TO PRESS.. It is an attempt, so says the author, to discuss some of the larger aspects of the training of salesmen and sales managers in our industries. The first chapter entitled Towards Higher Sales Efficiency, indicates that this booklet is an addition to productivity literature. The author's effort has been commended by Sri PA Gopalkrishnan, sometime Chief of LIC, where the author works, also by a prominent industrialist, Sri YA Fazalbhoy. The author has dedicated his booklet to HH Ismail, Consul General for the Dominican Republic. The best part of the book, however, is a quotation with which it begins, a highly significant quotation at a time of Defence Mobilisation:

"The tragedy in our business is that most of us go out hunting with sling shots... and we travel miles and miles... and we work terribly hard and we get terribly discouraged and we kill a few rabbits... why not use the high-powered rifles that are now available?..."

Textile Industry in USSR & Czechoslovakia*

Through the good offices of the Governments of the Soviet Union and Czechoslovakia, the National Productivity Council of India sent a Team of 13 experts (managers, technicians, research workers and labour leaders) to study the productivity of the textile industry in the two great countries. The conclusions at which they have arrived as presented in the main body of the Report published by the National Productivity Council, have to be interpreted in the context of the basic framework within which the textile industry functions in the two countries under reference. Below extracts have been printed from the Introduction (to the Report) which gives the background. This may be supplemented by a reading of the Summary of the Report which has been printed here *in extenso*.

THE TEXTILE INDUSTRY IS ONE OF USSR'S oldest industries, and most of the textile mills, in the Moscow-Leningrad area are 100—150 years old. The buildings are the typical old multistoreyed structures, and the layout is not streamlined. Cleanliness in the mills was reasonably satisfactory. Materials handling was almost universally mechanized with the help of different kinds of conveyors and battery-operated trucks. Since the Second World War, considerable modernization has been taking place in the textile industry. Soviet machinery is preferred, though in a few cases machinery from other countries, both Communist and non-Communist, has been installed. The funds for modernization are largely supplied by the State and partly derived from the factory's share of the profits in sale of cloth and from the Depreciation Fund. Depreciation is allowed at 9% on machinery and 3% on buildings and must be utilized within a

specified period for repairs, renovation or replacement of machines and buildings.

The planned expansion of the industry is through expansion of present mills as well as installation of new mills. The latter is predominantly in the cotton-growing areas of Uzbekistan and other Central Asian Republics. In addition to government mills there are as many as 3,000 small factories, owned and run by collective farms. These range in size from 2,000 to 20,000 spindles and 40 to 120 looms.

An outstanding feature of the Soviet textile industry is the importance attached to the education and training of the worker and to labour welfare. Eighty to eighty-five per cent of the workers and staff of every factory visited were women. The minimum qualification required of a worker is ten years of schooling, that is, high school graduation. In addition, special technical training is given for a period of 14 to 16 months in schools attached to each factory. Only then is a worker considered qualified. Ample facilities are provided and encouragement given to a

*Productivity Team Report No. 19: published by the National Productivity Council of India, 38 Golf Links, New Delhi, November, 1962, price Rs. 3.00, pages 104.

worker to advance his or her technical qualifications through evening classes of technical middle schools and colleges conducted at almost, every factory. Welfare facilities, such as canteen, club, clinic, library, etc., are generously provided, mostly financed by the State. Housing is provided by the State at rents of about 4 to 5 roubles (1 rouble is approximately 5 rupees) per month based on a nationwide standard rent of 0.13 to 0.16 rouble per square metre. Services such as water, gas and electricity cost an additional 10 to 12 roubles per month. *Most workers' homes we saw were well kept and comfortably furnished. Many had radios and T.V. sets.* Education and medical facilities are completely free. Liberal sickness and maternity leave benefits are provided. Retirement age is 55 for women and 60 for men workers and the worker gets a pension on retirement provided he or she has put in 25 years' service. Children of the workers, in fact throughout the country, are extremely well looked after through kindergartens, pioneer camps, summer camps, etc. The worker is thus reasonably free from worries about his and his children's future.

The minimum national wage is 44 roubles and the minimum wage in textile industry 48 roubles per month. The average wage of textile workers is 90 roubles a month. The average number of earning members per family is also higher than in India due to conditions of full employment in the USSR.

The director of the factory, who is the highest executive, gets a maximum of 380 roubles per month. We were told that during the last five years, the real wage of the textile worker has increased by about 20 percent. This increase has been due to increased productivity and reduced cost of living. Various kinds of incentives for quantity and quality of production, social behaviour, etc., are given the biggest incentive being perhaps the fact that there is no limit to which a worker may rise.

Planning is the key-note of the working of every factory. Wherever we went, discussion centred round fulfilment and overfulfilment of plans. Workers, through vari-

ous committees, have an important voice in the formation of these plans. Identification with the goals of the organization and cooperation to achieve these appeared to be accomplished more easily because of worker participation in planning, and other management functions. While provision for disciplinary action exists for bad work, negligence or anti-social conduct, such cases arise very rarely. A branch of the Communist Party exists in every factory and membership of the party is considered a great honour. Only when a person proves to be a good worker and a good citizen is he elected to membership of the Party. The Secretary of the Communist Party in each factory is a very important person, and through "moral education" of the workers contributes considerably to the fulfilment of plan targets.

Inspection of grey and finished goods is obligatory and every metre of cloth produced is examined. Weaver's wages are based on both quantity and quality of production. In every mill visited by us, 91—93 percent of the production satisfied Grade I standards.

As in USSR, the cotton textile industry in Czechoslovakia is also old. It consists of 2 million spindles and 40,000 looms and employs about 40,000 workers. Thirty to forty percent of the looms are automatic. In the opinion of the Team, the extent of renovation was much less in Czechoslovakia than in the USSR. One major difference in the textile industry of the two countries is that Czechoslovakia exports nearly 30 percent of its production. This has naturally an impact on production methods and technology. Thus, for example, the extent of diversification of production, particularly in chemical processing, is far more than in USSR. Also, the majority of the units were smaller in size compared to those in USSR. There are major differences in the organizational structure also, though the basic pattern of the industry is the same in both the countries.

In general, the machinery in our mills is equally good in design, and in some cases superior to the machinery employed in both