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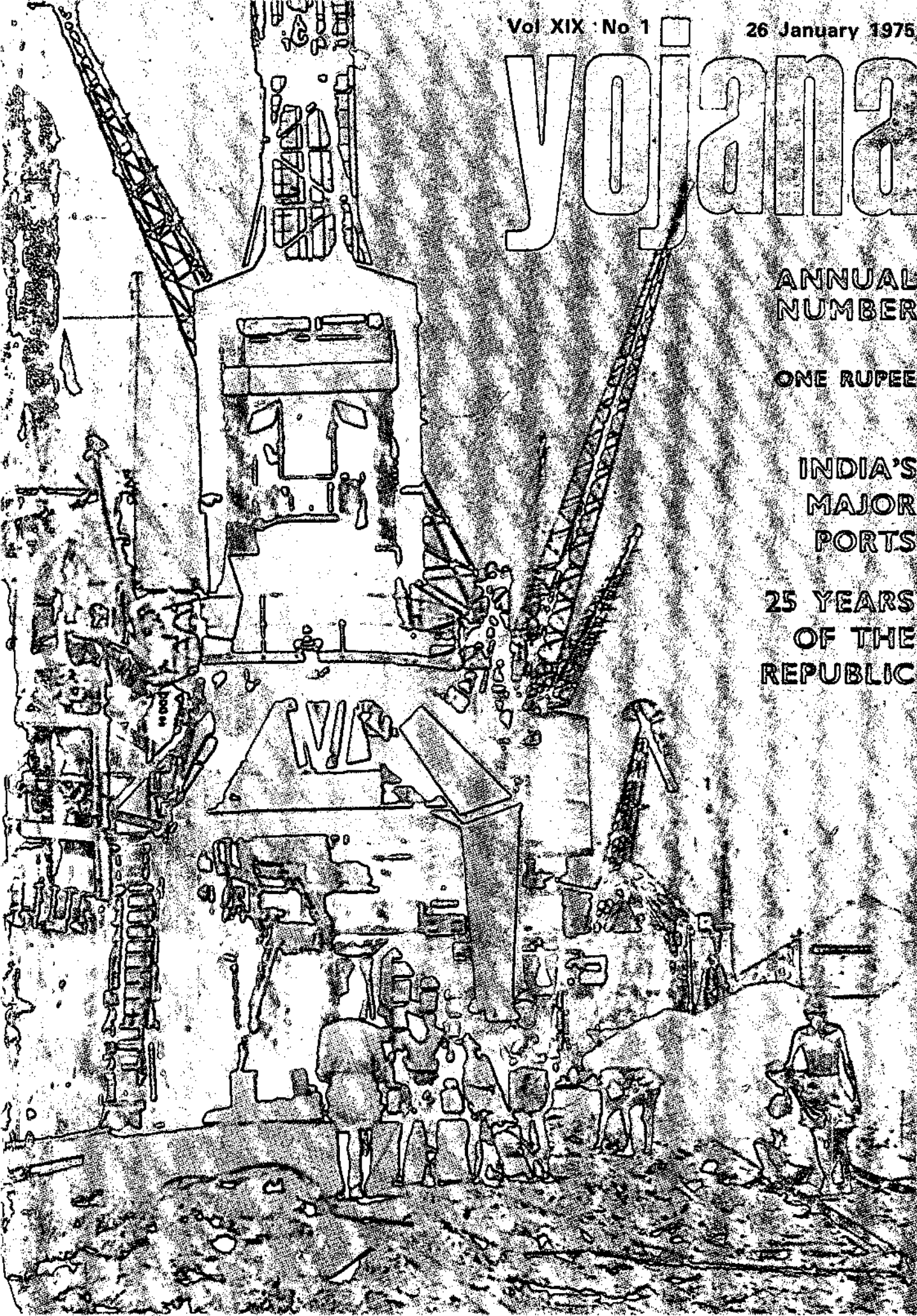
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25 YEARS
OF THE
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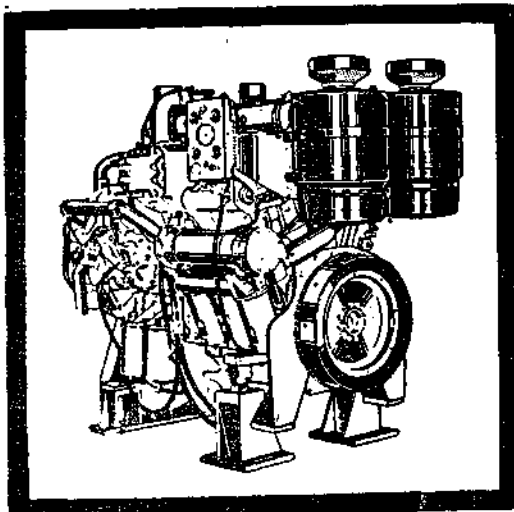
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A People on the March

THREE CHEERS TO THE REPUBLIC

ON this day of January 26 India celebrates 25 years of her existence as a republic. It is customary to review the record of one's performance at such a time. We do so now not only because it is a widely prevalent practice but because an assessment of our achievements and failures is also a necessary guide to future action.

Twenty five years is a big chunk in an individual's lifetime. But, for India whose people proudly look back to milleniums of history, this fleeting passage of time symbolises but a milestone. Nevertheless, it is an important milestone. In this short span of time about one-seventh of mankind has tried to compress the experience of several generations. They attempted to sprint with legs too weak or speed, with a heart that had been bled by partition and a mind weighed down by the overburden of the past.

we look back, we see that gateway through which emerged into freedom is

THE REPUBLIC OF INDIA

26th January 1950

WE, THE PEOPLE OF INDIA, having solemnly resolved to constitute India into a SOVEREIGN DEMOCRATIC REPUBLIC and to secure to all its citizens:

JUSTICE, social, economic and political, LIBERTY of thought, expression, belief, faith and worship,

EQUALITY of status and of opportunity, and to promote among them all

FRATERNITY assuring the dignity of the individual and the unity of the Nation;

IN OUR CONSTITUENT ASSEMBLY DO HEREBY ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION.

right behind us. Before us, however, lies stretched out, to the limits of a receding horizon, the long, winding road to prosperity.

A whole new generation of men and women who never had to breathe the murky air of serfdom has come to the fore. To them freedom has been part of life. Of the travails that the country had to pass through, just to see that they were born free, they know only from text-books. There is therefore some difference between the freedom the Indian people fought for and the freedom that our young men and women came to be born into. The one was a vision, the other is a reality. The one was marked by sacrifice, the other is marked by expectations.

This is natural. The passage from vision to reality is rarely pleasant. The gild



PHOTO : UNITED NATIONS





COURTESY : UNITED NATIONS



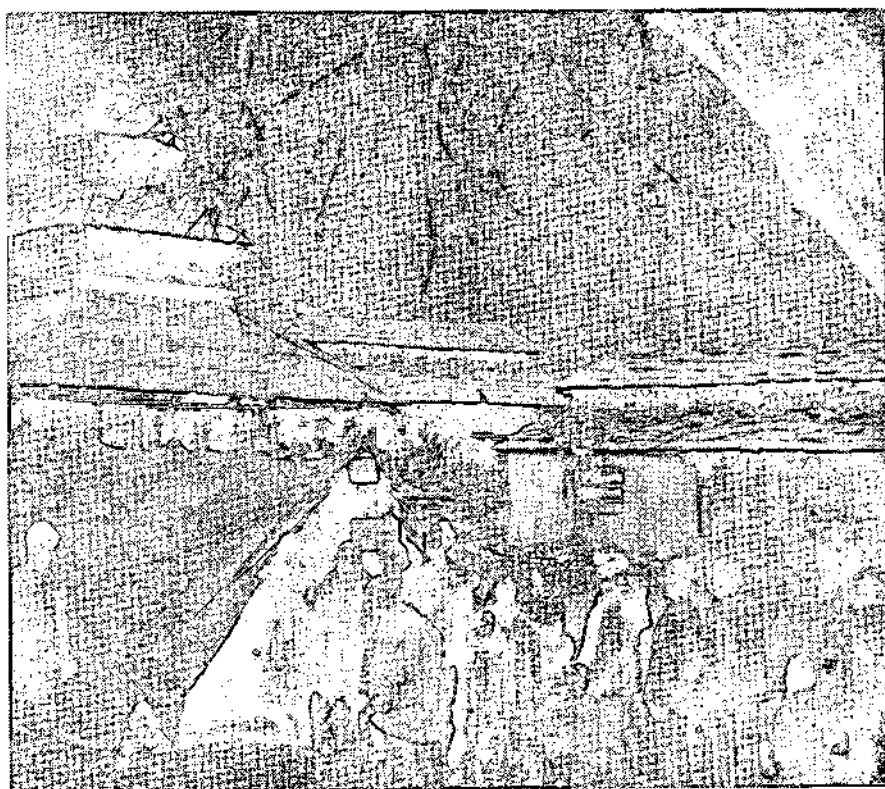
and glitter of the dream wears off, exposing its inner core—the stark challenge of a revolution still to be completed. So if the Constitution had to be a major instrument of change it had to provide for this passage, however long or however arduous.

India was fortunate in a sense. The soldiers who were inspired by the vision of a free India were also called upon to be the architects of its future. They laid its foundation with a mixture of the dream and an awareness of the facts of life in a vast, over-peopled and poor country awaiting development.

That foundation is the Constitution of the Indian Republic.

Our Constitution is essentially Indian in character, and in some ways unique. Its makers drew mainly from the lessons of their own freedom struggle. The constitutions of other great democracies and the British Parliamentary system in particular had





influenced them. The instrument they eventually forged after prolonged public debate was not only meant to shape the political institutions but also provide the tools for social transformation. It repudiated in unequivocal terms the ills that had plagued India for ages—untouchability, disparities based on caste and sex and mass illiteracy. It provided for the basic freedoms of the citizen by incorporating a section on Fundamental Rights and gave every adult the right to vote by secret ballot.

An enunciation of Fundamental Rights by itself may not carry a society far. So in their wisdom they also incorporated a set of Directive Principles. In essence, these Principles set before the nation the social, economic and cultural goals which it should strive to reach within the framework of the Constitution. At the centre of this envisioned picture they placed the common man—that hapless, anonymous being who had been the

victim of the neglect of centuries.

The Constitution, too, has grown with time. The tempo of events has left its impress on it, without altering its essence or eroding its sanctity. There have been several challenges in these years to the innate strength and resilience of not only the Constitution but the democratic will of the people.

Public debate, a free Press and Parliamentary opposition have all played their part in this.

These challenges have arisen primarily from the multi-lingual, multi-religious character of this nation with large concentrations of poverty and backwardness. The "one-adult one-vote" idea, tested in five General

COURTESY : HINDUSTAN TIMES

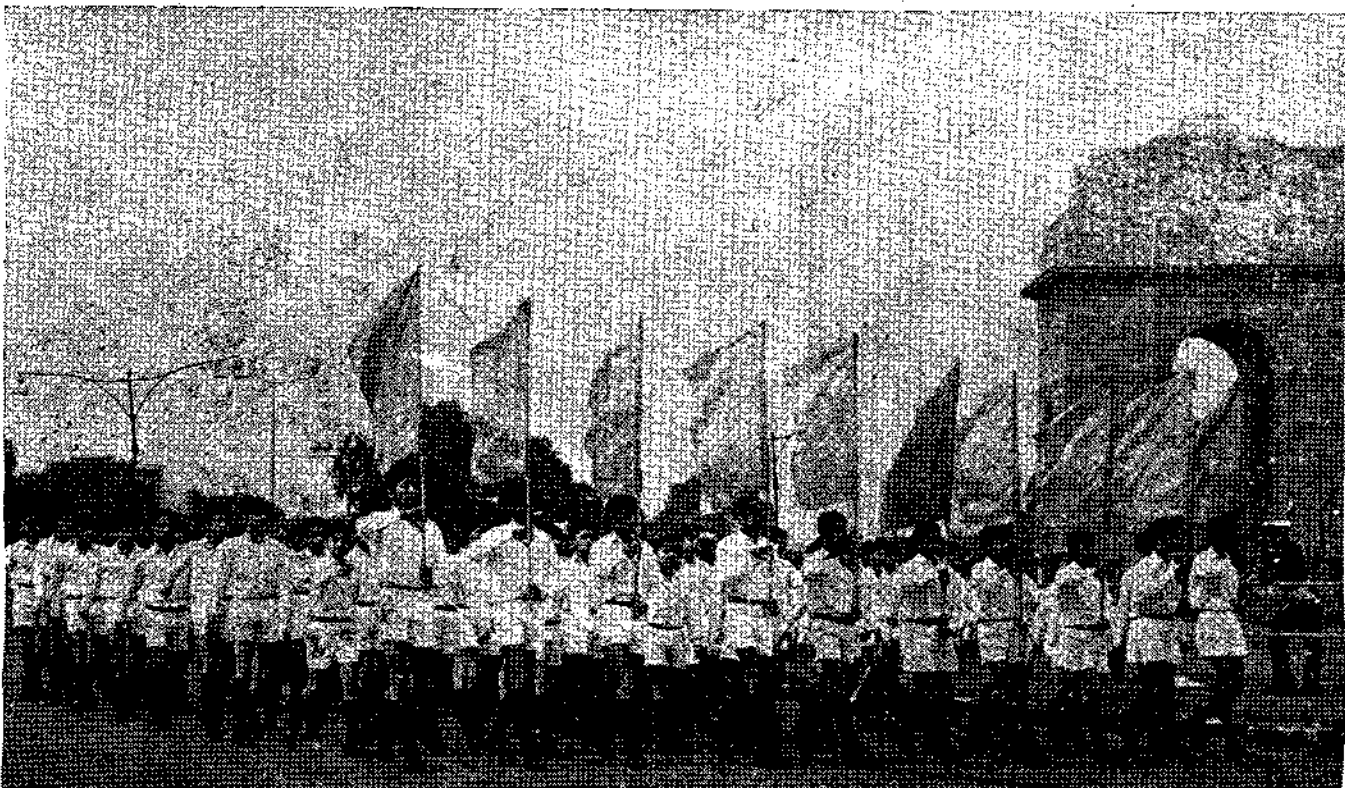


Elections contested by parties of varying political persuasions, has raised the expectations of millions of men and women. It has given them a sense of power which they did not possess before.

At the same time, mostly arising from the interpretations of the Judiciary or strongly registered public protests, several clauses of the Constitution have been amended to keep its letter and spirit in tune with the people's will as represented in the legislature. The Constitution is not, and was not intended to be a rigid steel framework—unchanging, unchangeable. With the passage of time it is bound to acquire the impress of new events and new attitudes as expressed by the people. But this cannot take away from it its principal role as an instrument of national cohesion and as the fountain-head of basic human values like liberty, equality and justice which everyone in India has come to cherish.



PHOTO : ABOVE; B. S. AMAR





DEVELOPMENT CAME IN THE WAKE OF FREEDOM

Bedevelled by problems unheard of in history, India's future after the attainment of freedom and the promulgation of the Constitution appeared none too rosy. Many friends even doubted the viability of the new Republic as a self-reliant, stable democracy, capable of tackling a disheartening range of economic problems, each contending for priority of attention. Right from rehabilitating eight million refugees reduced overnight to penury to finding food, shelter and jobs for many times this number and building up a vast infrastructure for an industrial economy was a task of Himalayan proportions. It called for courage, imagination and sacrifice in equal measures. Therefore, from freedom to Constitution to planning was a logical process. The road ahead was bound to be long as in fact it still is. What we have seen these 25 years are road blocks at almost every forward step we have taken.

The fact is that we have taken many forward steps.

Reactor under Construction. Atomic Power Station, Ranapratap Sagar, Rajasthan.



Left: Harijan boys in a village school. The literacy percentage among scheduled castes has risen to 14.7 per cent from 10.7 between 1961-1971.

Right and Bottom: India produces over twice as much food-grains as it did in 1951. The transition from antiquated methods to modern farming is a slow, continuing process.

Statistics tell only part of the story.

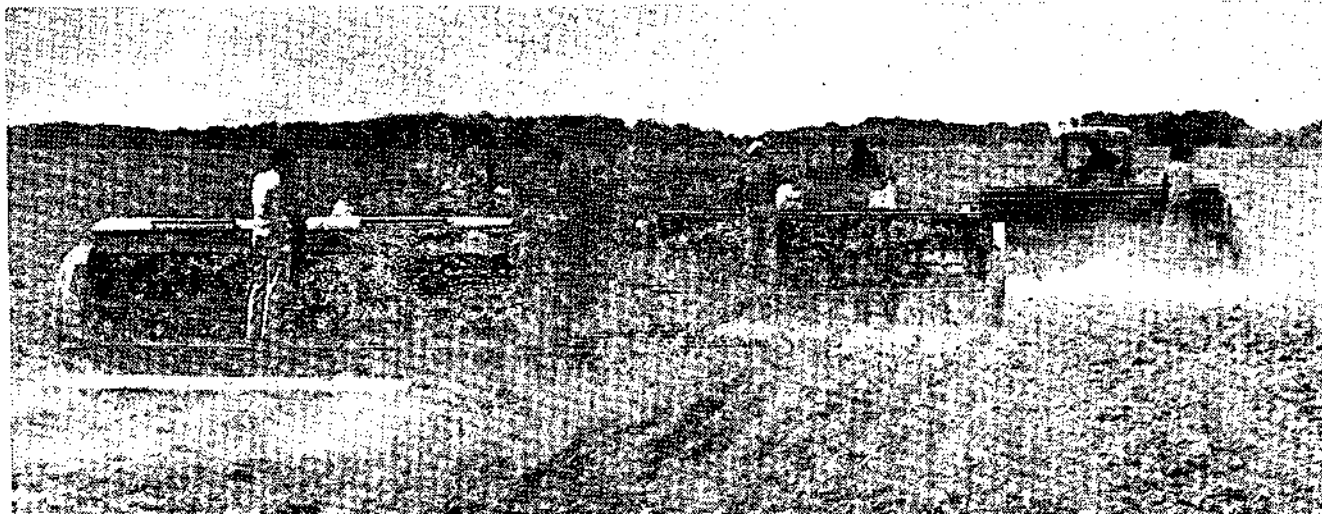
When we started off as a free and sovereign republic

Now and then we have also taken a leap or two. Do we seem to have fared well as we look back? Have we gone wrong anywhere? Could we have done better and shall we be able to do better?

These are all relevant questions, and each has an affirmative answer.

As we look at the balance sheet we have to bear in mind the important fact that

whatever we have accomplished or failed to accomplish has been within the framework of the freedoms that our Constitution has guaranteed to every citizen. The value we attach to these freedoms is a part of our national ethos. It is the essence of our way of functioning. Coming to the balance sheet again, we have to look both at the statistics and beyond it.



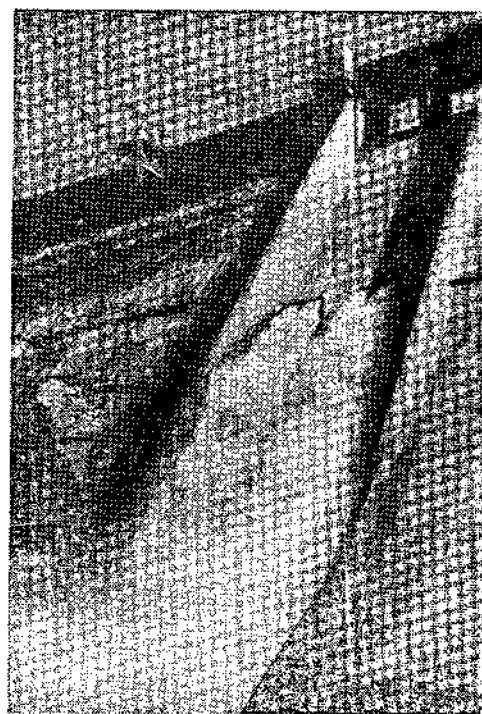
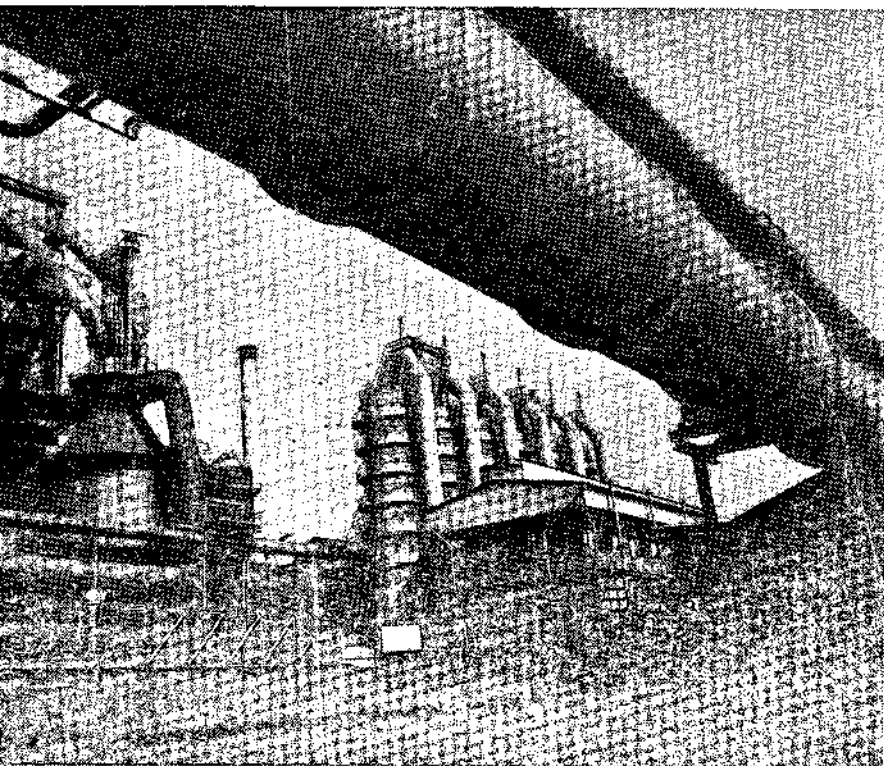


we had a population of 380 millions. Today we number a fantastic 580 millions and this threatens to grow to around a 1000 millions within the next 25 years! This fact has to be borne constantly in mind when we talk well or ill of our own accomplishments.

At the same time, our wealth measured in terms of net national product has more than doubled. We produce two times as much of foodgrains as we did in 1951.

We have brought water from newly built reservoirs and deep wells to over 22 million hectares since 1950-51. Today as much as 160 million hectares are under cultivation. We now produce more of everything that we

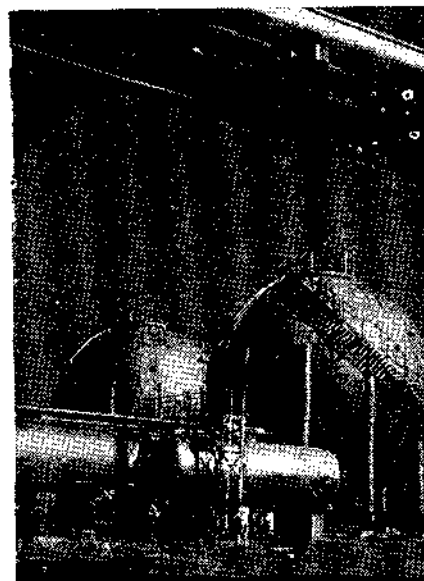
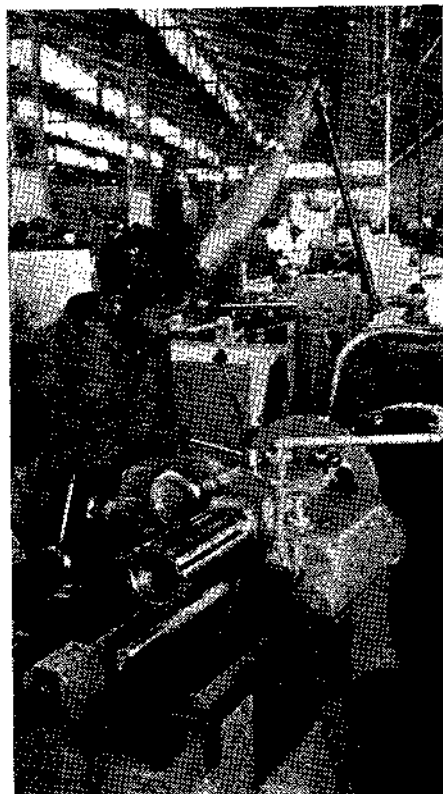
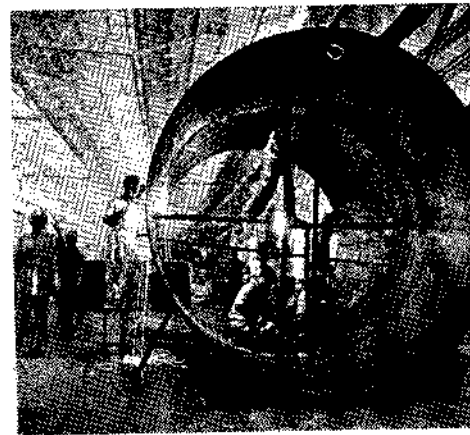
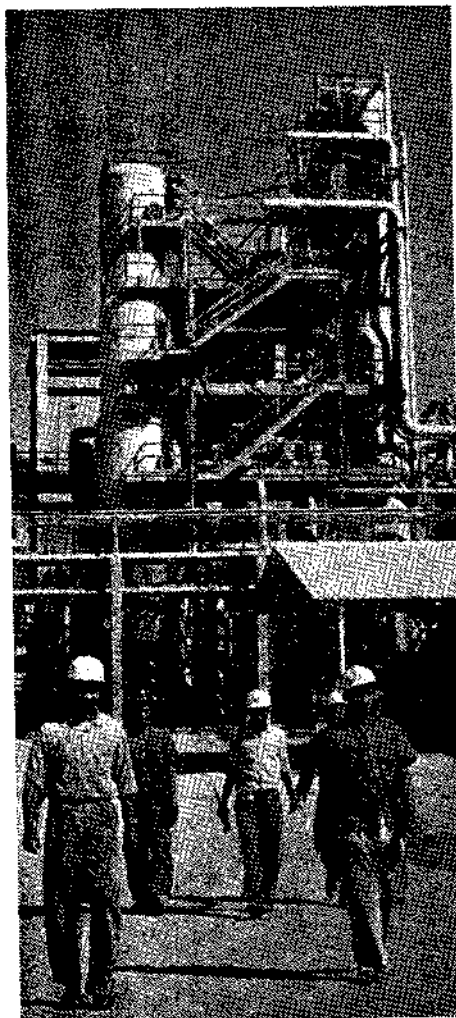
Left Above: Trainees of the Hindustan Machine Tools, Hyderabad.
Left Bottom: Blast Furnace and Gas Cleaning plant, Rourkela Steel Mill.
Bottom: The Bhakra Dam, Punjab



consume. In some cases, like potatoes and other tubers, pulses, sugar, vegetables, fruits, milk and eggs, we produce twice or more than twice what we did 25 years ago. The production of some of these, like, sugar, eggs and vegetables has increased manyfold. In regard to some of these commodities, the progress has been startling. For instance, we produce over three times the quantity of sugar we did in 1950-51; nearly twice as much of jute; eight times as much of coffee; 60 per cent more of tea; twice as much of oilseeds; seven times the quantity of paper and board; seventy-six times as much of fertilizers; five times as much of steel; nearly three times as much of coal; twenty-two times as much of oil; over twenty-five times as many of bicycles; six times the number of commercial vehicles, cars and jeeps; ten times as many of electric and diesel locomotives and nearly eight times as much of cement.

The list is long. There are things which we never produced before like machine tools and watches but which we produce now.

We have invested nearly 110 thousand crores of rupees (at 1974-75 prices) in our plan projects both in the

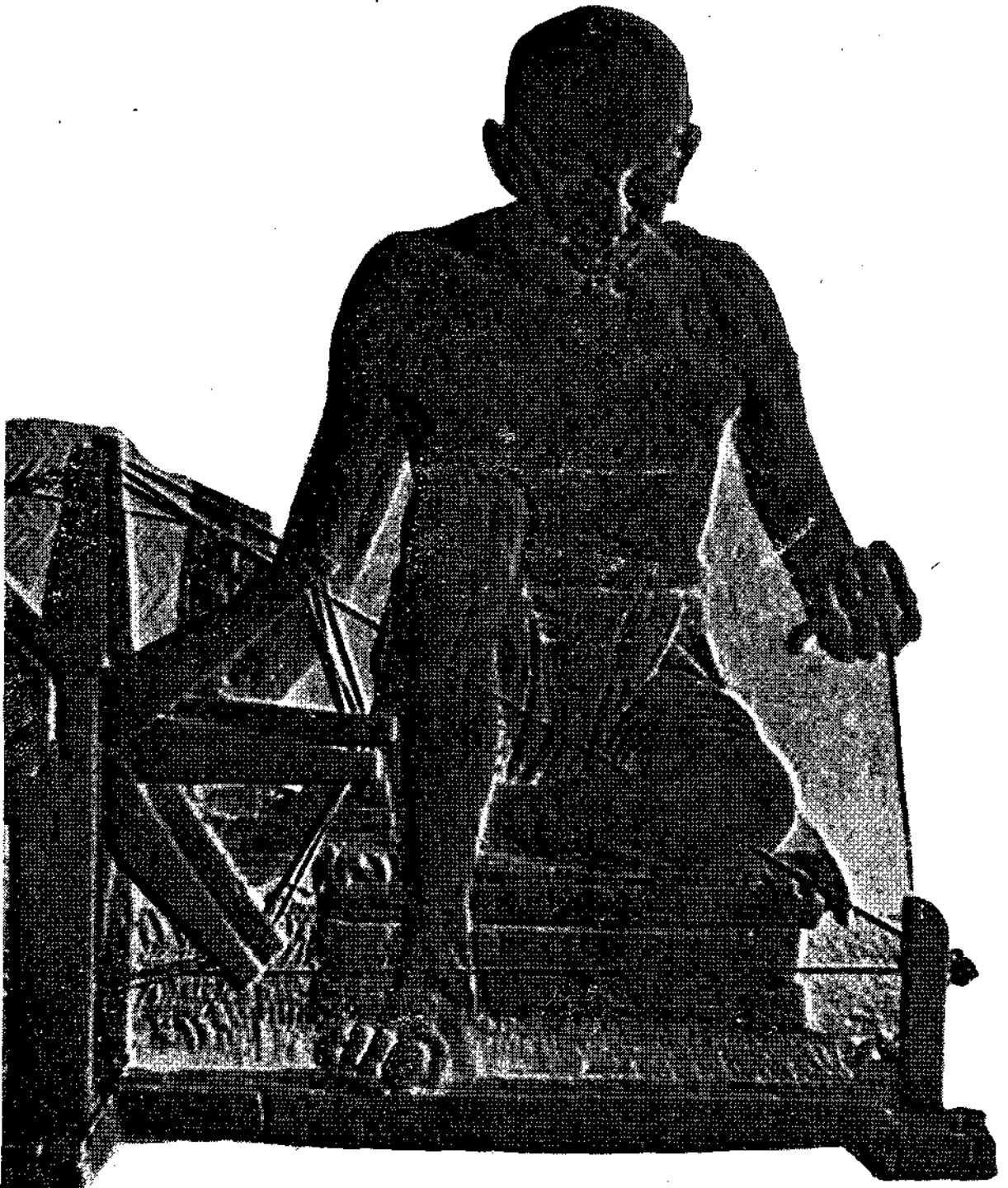


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- Top Left : Hindustan Aluminium Plant, U.P.
 - Top Right : Welding in the Fabrication Department, Bharat Heavy Electricals, Bhopal.
 - Middle Right: Synthetic Drug Plant, Hyderabad.
 - Bottom Left : Hindustan Machine Tools, Pinjore.
 - Bottom Right: Rourkela Fertilizer.

The service of India means the service of the millions who suffer. It means the ending of poverty and ignorance and disease and inequality of opportunity. The ambition of Gandhi, the greatest man of our generation, has been to wipe every tear from every eye. That may be beyond us. But as there are tears and suffering so long our work will not be over.

And so we have to labour and work hard, to give reality to our dreams....

—Jawaharlal Nehru





public and private sector upto 1974 and we are likely to spend as much as 45 thousand crores in the Fifth Plan to strengthen our economy.

The number of students in our schools has increased by nearly four times to

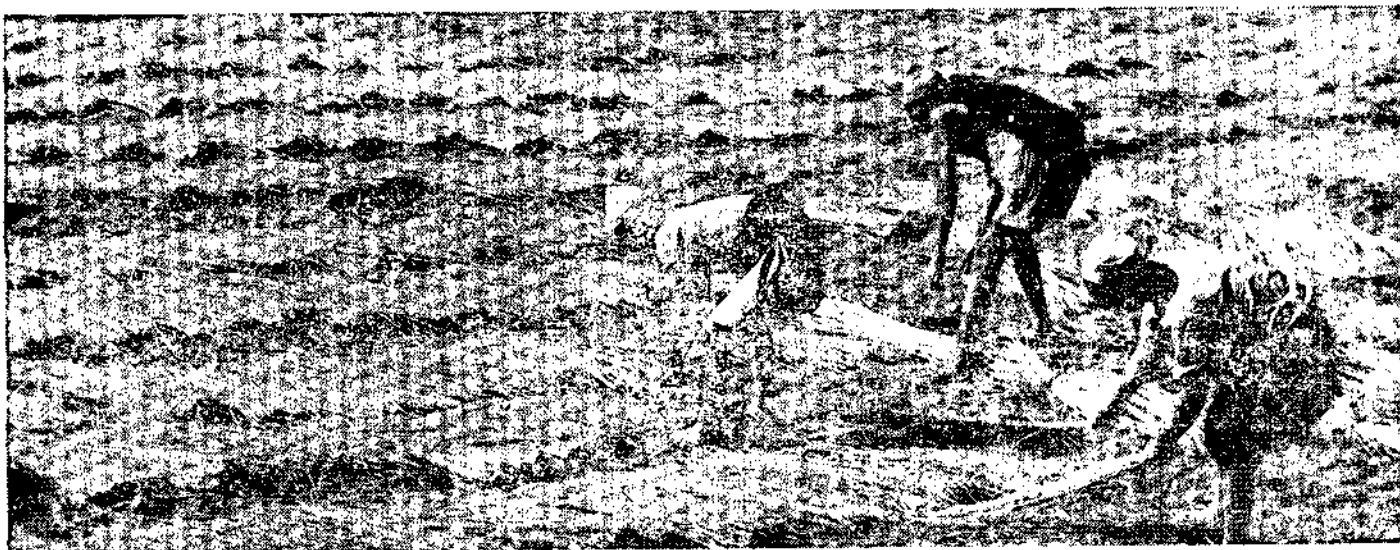
eighty-eight millions; we have 99 medical colleges where we had 30 and nearly 140 thousand Doctors, where we had 56 thousand; hospital beds have increased to 282 thousand from 113 thousand.

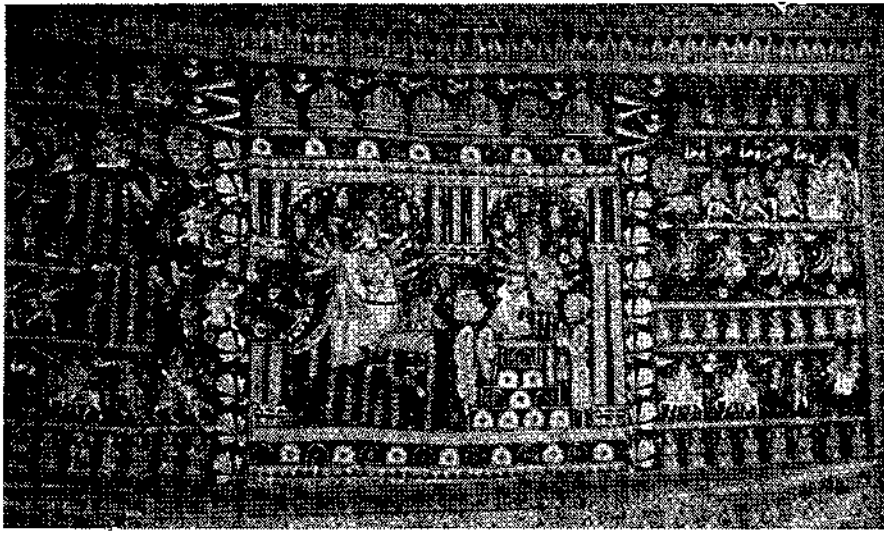
Hardly 15 of every 100 Indians knew how to read

and write. Today our literacy ratio, though still poor, has increased two-fold. We are next only to U.S.A. and U.S.S.R. in the number of doctors, engineers and scientists we produce.

Countless number of boys and girls belonging to backward classes get free education and some of them have risen to high positions of authority in public service. We have almost mastered the science and technology of the atom.

We produce in our own country railway engines and rolling stock, automobiles and a variety of aircraft. We produce, also, a wide range of weapons, electronic gadgets and army vehicles so that we are less dependent than ever on outside help for





defending our freedom. We produce steel, chemical fertilizers and a large variety of chemical products, medicines and drugs all of which we had been importing before.

- Even our traditional handicrafts and Khadi are among the important foreign exchange earners, not to speak of other traditional export items like coffee, tea and spices all of which we

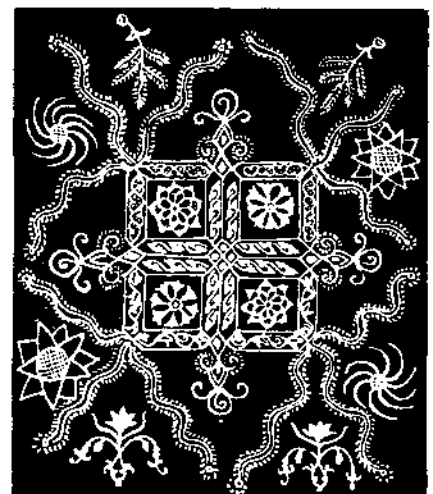
are producing twice or thrice as much as we were doing before.

Boys and girls receiving higher education in schools and colleges have increased more than ten-fold causing the problem of the educated unemployed. The life span of the average Indian has increased from 42 years in 1950-51 to 53 years in 1974, thanks to near eradication of malaria, small pox, plague and other such mass killers.

Trained extension workers have fanned out into the villages bringing both the message and the know-how to improve health, agriculture and marketing. Where the benefits of development cannot be directly seen, their impact can be felt in towns, cities and villages among people who have learnt to expect more but do not have more.

With all this, we are still a poor country. Not because we have done little to improve our lot, but because we have not done enough. How much is enough is a question difficult to answer. But we can see that after all these 25 years of growth there are large areas where poverty and backwardness are concentrated, where archaic ideas which have no relevance to growth still rule the minds of men, where social justice is denied to one section of our people by another section.

In sum, we see the spectacle of a great country on the





At a Family Planning Clinic



PHOTO B.S. AMAR

march, dogged at every step by limitations and obstacles of almost every kind—paucity of resources, disagreement among ourselves on language, sharing of river waters and other resources, lack of personal involvement in programmes whose only aim is to benefit the community and, above all, a tendency to belittle our own performance and play up the depressing aspects of every situation. That we have travelled only a short

distance and have a long way to go is the basic fact of our life.

This recognition should give the Indian people the sense of urgency that a total dedication to the cause of progress demands. As we proceed from one Republic Day Anniversary to another, from one five year plan to another plan, deriving confidence from our achievements and lessons from our failures, the future destiny of India is bound to unfold itself.

In the following pages *Yojana* presents, in the words of leaders in Government, industry, science and public life, review articles on select subjects, giving their assessment of the nation's performance.

Yojana conveys its greetings to all its readers on this occasion of the Silver Jubilee of the Republican Constitution of India.

Into that Dawn of Peace and Plenty, Let My Country Awake



ECONOMIC and Social Planning was provided for in the Concurrent List to give life to the spirit embodied in the Fundamental Rights and Directive Principles of our Constitution. We have established important institutions designed to formulate plans and implement them. In these 25 years we have undoubtedly gained rich practical experi-

ence. For all the addition to our economic capacities and infrastructures our people continue to be very poor. Given the will, we can change this situation in a decade. What we have failed to do so far is to involve large masses of working people at the outer periphery of growth and change in the process of planned development. Parochial forces which

have surfaced so conspicuously in recent years have inhibited integration and the growth process. These forces must be eliminated and the spirit of self-reliance must become manifest in each local community, region and State. This is possible only when local democracy functions as a live force in our national polity.

Planning and the Constitution

TARLOK SINGH

IN its Fundamental Rights and Directive Principles, India's constitution, reflected enduring values and aspirations. Yet, several of its specific provisions were limited by structures which the leading figures of the Constituent Assembly had known at first hand. In providing for Economic and Social Planning in the concurrent List, they had looked to the future and helped, thus, to make planned national development a practical undertaking.

Despite setbacks in recent years, the formal processes of planning are now fairly established. Whatever the changes in political fortunes, Governments at the Centre and in the States can be expected to join together in drawing up and implementing composite national plans. Exercises in the planning of investments are strongly underpinned by an elaborate system for transfer of resources, by way of loans and grants, from the Centre to the States. But this is only the beginning.

The substance of planning consists in the preparation of a widely accepted national design for the future of the economy and the future of society. Planning is of small avail if it is not focussed on the deeper, underlying problems of the economy and on the essential needs of the mass of the people. On these tests, as a nation, we have achieved less than we might have, and have still a great distance to go.

For all the additions to our economic capacities and infrastructures that have taken place, India now holds the largest single concentration of poverty in the present-day world. If we so will, this condition can be ended within less than a decade. The land problem will not be solved without fundamental changes in the agrarian system and in the management of land and

other resources. Ceilings on land holdings and tenancy protection are but the first steps. Mainly through persuasion, demonstration and incentives, we have to work towards a substantial pooling of land and labour in the common interest of each rural community as a whole, including those with and without land. Up to the present, the growing rural proletariat, comprising petty and small farmers, agricultural labourers, and a large proportion of those engaged in household industry, remains at the outer periphery of growth and change. The very processes of technological and economic development lead, in the ordinary course, to greater differentiation among individuals, groups, states and regions within States. *For the gains of development to spread well beyond the locations of new investment, the trend towards a national labour market has to be strengthened as a matter of policy. Currently, parochial forces are gaining ground in most States, without serious resistance from any political party. This can be the undoing of much that has hoped for at the making of the Constitution.* Further, there is urgent reason to enhance the capacity of each local community, each region, each State, to achieve sustained growth in terms of its own human and material resources.

Will goals as large as these be reached through our present political and constitutional structure? As we well know a multiparty parliamentary system is a bulwark for personal freedom. Is it also a guarantee that basic economic and social freedoms will become available to the masses of our people? Here, there is ground for concern in the light of what we have learnt through the years. As Walter Lippmann had stressed, fear of loss of office or defeat of candidates in elections induces all parliamentary parties to turn to soft options and to seek short-term advantage at the expense of genuine search for solutions to truly difficult problems. In this respect,

dedicated regions, working without the constraints of liberal democracy, are able to perform better. The lesson is writ large before us. In a parliamentary democracy like ours, basic reforms at the grass roots, which also require changes in values and attitudes on the part of large numbers of people, can be accomplished and will be even more lasting than in other systems. But, there are two conditions. A base of public opinion must be prepared and there should be a sufficiently wide agreement, going beyond the immediate concerns of different political groups, on the main directions of change. At the present juncture, essential national reconstruction is far more likely to be carried further if, through constitutional and other means, steps are taken deliberately to strengthen institutions which will promote more broad-based unity in policy and action at every level of national life.

The fifties were a period of innovation during which, in the spirit in which the makers of the Constitution had laboured, several important institutions came into existence or were felt to be necessary, with the precise object of developing broader and more comprehensive approaches to planning and plan implementation. With the practical experience we have gained, we could now consider embodying certain of these institutions within the constitutional structure, while sustaining others through appropriate conventions. Such a change from informal to formal arrangements will make at once for greater national unity and more rapid economic and social progress, without diminishing creative opportunities open to individual political parties. There are six main proposals to be made.

In the National Development Council, we have had a body since 1952 which brings together the leaders of the Central and State Governments, irrespective of political affiliation, for the specific task of planning and development in all its

*Shri Singh is a former member of the Planning Commission and author of several books on India's planning and development.

policy aspects. More could be achieved through this institution. *It would be in the national interest to accord to the National Development Council a legitimate place in the Constitution, to give to its work greater weight and continuity, and to make fuller use of Committees of the Council in several key areas of national policy.*

Secondly, whatever its shortcomings, the Planning Commission has come to stay. The Planning Commission belongs as much to the States as to the Centre. Such a body will serve the nation better if it finds a place in the Constitution. Without lessening the responsibility of the Governments of the day for proposing and carrying out their own policies, the scope and objectives of planning will not be in a doubt and Parliament and State legislatures will be able to give greater support to the larger objectives of national planning.

Thirdly, since the early sixties, the need has been felt for a machinery for planning at the State level which could go beyond the customary departmental approaches and could take a creative view of the effort possible in each State. Thus far, the response in the States has been half-hearted and there has been too little experimentation and drawing out of the real potential of our institutions and capabilities. Therefore, the time has come to provide constitutionally for State Planning Commissions. This could bring greater depth and variety improvisation to planning at the level of the people.

Fourthly, despite some hints from Gandhiji, when the Constitution was being forged, beyond the direction in Article 40, there was yet no clearly formulated view of the place of local democracy in our national polity. In part, as a consequence of community development, a substantial network of Panchayati Raj institutions has now come into existence. But all of this rests on a tenuous basis. In several States, scarcely were the institutions established when a process of decline began. To have or not to have local democracy is an issue of national importance. In the light of our experience since the mid-sixties, it would be desirable to provide for the institutions of local democracy in the Constitution, while leaving several details of legislation and implementation to the States.

In the fifth place, in a parliamentary system, institutions which seek to coordinate common purposes in terms of national interest will achieve more if they can invoke the constant support and vigilance of appropriate legislative bodies in which different political parties can participate meaningfully as a matter of right as well as of public duty. Therefore, by convention, after the necessary consultations, provision should be made for a Standing Parliamentary Committee at the Centre, to be headed by the Prime Minister, and for similar committees in the States to be headed by the Chief Ministers.

A word should be said, finally, on the subject of financial relations bet-

ween the Centre and the States. In their essence, the present relationships belong to a pre-planning period. The periodic devolution of resources through the Finance Commission and Central assistance given to the States on the advice of the Planning Commission, both rest on a scheme of distribution of sources of revenue which leads inevitably to enormous dependence and subordination to the Centre of all but a few States.

One of the principal long-term aims of national planning must be to increase self-reliance at every level and to enable each community, each region, and each State, to become viable enough to plan effectively for its own development, looking to help from above only to the minimum extent necessary. Under existing conditions, this aim cannot be realized. Resources and responsibilities have to be better correlated than in the past. Therefore, the stage has arrived for a fresh examination, in the total national interest, of the scheme of allocation of resources between the Centre and the States in terms of what has to be accomplished in the future. A modified scheme of distribution of resources should provide, not only for the States, but also for representative rural and urban bodies at the local level. The proposed re-examination should assist in evolving the principles of a more unified national tax system which takes the Centre, the States, and civic and local authorities within its general purview.

25 Years Of Parliament

G. S. DHILLON

THE Republic Day this year has special significance for us because we shall be celebrating the Silver Jubilee of the Founding of our Republic and the birth of the sovereign Parliament of India. It has become customary to measure progress and reckon achievements in terms of chromatic segments. In the case of India at least, looking back over the years, what a momentous period it has been—the last twenty-five years!

Through all these eventful years, when one comes to think of it, the central stage of action has been Parliament; it is in, with or through Parliament that the drama of life is being played. A major fact of the Indian political scene is the primacy we have accorded to Parliament in the national scheme of things and the growing relevance of its corporate personality as a mediating factor in the democratic politics of our country.

In a sense, India has been fortunate in her history. Few legislatures in the world have perhaps been ushered into existence under better auspices or ever got on to a better start than the Parliament in India. When I say this, I have many things in my mind. Foremost among them, lying as a bedrock, is the democratic temper of the people themselves; a temperament prone to tolerance, adjustment and harmonisation, a view of life based on the recognition of the validity and worth of the individual, which looks upon the entire human race as one family—*'vasudhaiva kutumbakam'*—the core ingredients in our national ethos which, to my mind, have been most conducive to, and constitute a lasting guarantee of success of the democratic order in India. Equally significant has been the continuity of the legislative tradition. That the legislative assemblies of pre-Independence times were hamstrung on every side hardly had anything to do with the importance of the experience gained therefrom. As has been rightly said,

Shri Dhillon is the Speaker of the Lok Sabha

the fact that some of the leading men of the freedom movement had sharpened their skills and developed affection for the parliamentary institution was a factor of inestimable value. Stalwarts like Motilal Nehru, Bhulabhai Desai, Mohammed Ali Jinnah, Satyamurthi, etc. who are still remembered for their high standards of debate and conduct in the legislature, had raised the prestige of the legislative institution. The values engendered by the freedom movement which included an abiding faith in the efficacy of the Legislature as a people's institution, as the principal guardian of public liberties and interests and as an instrument for national regeneration—have also to be counted among the legacies of our present-day Parliament.

Mention should also be made of the men at hand, apt to the occasion, who protected the parliamentary tradition at the crucial moments. Was it not entirely fortunate that we should have had as the first President Sir Frederick Whyte, one steeped in the traditions of the Mother of Parliaments, and as our first ever elected President, Vithalbhai Patel, who really laid the foundation for the future Parliament of India? Memories of his tenure have been a permanent inspiration with us in our legislatures ever since. When the country's legislature emerged as the sovereign Parliament of the land we had a personality like Pandit Jawaharlal Nehru, who dreamt for us and gave shape and direction to the national will. His commitment to democracy and representative institutions only served to establish Parliament in the esteem of the people. It was again the country's unique good fortune that we had one like G.V. Mavalankar to preside over the destiny of the new Parliament. As one fully conscious of the burden of his trust he strove hard to equip the Legislature, through procedural and other institutional arrangements, to fulfil its new tasks as the sovereign legislature of the land.

World's Biggest Democracy

If it had all the auguries in its favour, no other Legislature has perhaps had to measure up to the range and dimension of the problems that the Parliament in India was called upon to shoulder from its very birth. That India is the world's largest practising democracy has become a cliché. The country woke to freedom with problems. First, as an aftermath of the Partition, it was a disquieting law and order situation and in its wake came a huge refugee problem. Then came the totally unexpected Chinese invasion which the people weathered and withstood. Soon followed Nehru's death when amidst the deep gloom the nation displayed a remarkable sense of unity and maturity and the transition to a new leadership was effected with commendable dignity and orderliness. Then there was the Pak invasion, which the nation rose as one man to meet and repel. Shastri's abrupt end came as another shock, but the succession issue was again resolved in a completely democratic manner. Then came the great split in the Congress which created, so to say, a political watershed in the post-independence history and released totally unpredictable forces. Ere long, another war with Pakistan and a refugee problem with telling consequences on the economy. The Nation is now caught up in the whirlpool of an economic crisis that is not merely national but global.

Whatever has been accomplished in the political, economic and social spheres during the last twenty-five years has been against this backdrop of chequered history. One of the first tasks the country had to undertake after freedom was to forge the diverse components of a heterogeneous polity into a cohesive whole. The

integration of the 500 and odd princely States and the redrawing of the map of India was a task of colossal proportions, whose successful accomplishment in record time is a tribute as much to the foresight and initiative of our leadership as to the basic adaptability of our people. The smoothness with which it was managed has tended to obscure the immensity of the task as well as its significance as the biggest step taken to dissolve feudalistic and other age-old loyalties and to bring together all the people under the pale of new national consciousness and a common loyalty.

There was then the task of nation-building and of laying the foundation for a just and equitable social order. In economic development, as in political evolution, we must remember that each Nation has to feel its way about. There is nothing like a ready-made recipe for growth. Development has to reckon with a country's history and its contemporary milieu—it has to be in consonance with the national ethos and take into account its basic constraints and imperatives. And in a country like ours, of continental size of bewildering diversity in habits of thought and living, where centuries of history live side by side, the task of modernisation assumed a dimension all its own. This by no means easy task has been accomplished through the process of consensual democratic politics. And it is Parliament and other Legislatures in India that have been the great mediators in this change.

The country's record in the pursuit of the goal of an egalitarian order—in initiating measures to restore basic rights to the underprivileged strata of society, in effecting transfer of resources from the urban to rural areas and in infra-structural investments to benefit the people at large—has, on the whole, not been unimpressive.

An encouraging feature of our political life has been Parliament's emergence as a major mediating force in our polity. The identity of Parliament has always stood out recognisably distinct and has not been allowed to get lost in or merged with the will or the voice of the majority party. This growth of the corporate image of Parliament has been greatly facilitated by the share we have accorded to the Opposition in our parliamentary life. The institutional arrangements by way of practices and procedures which we have devised ensure the opportunities needed to bring up public issues for debate in the national forum and to maintain continuous oversight of the Administration. In the Indian Parliament, as close observers of its functioning have noted, the actual influence which the Opposition wield bears little relationship to their heterogeneity or their numerical inconsequence. Today, the authority and prestige of Parliament is immense, which is because it has been fulfilling its functions rather remarkably well.

As I, sitting in the Chair, pulsate to the ebb and tide of the collective emotion of the House, all my concern has been to see that we succeed in retaining this representative institution as the principal channel of political communication and as a vibrant link between the Government and the people. What we need most is faith in ourselves and a total commitment to the democratic system. I would like to close with a sentiment expressed by the then Lord Chancellor, Lord Hailsham when he was here a few years ago:

"The real democrats are not the detractors, but the participators, the builders, the optimists, the people who see that in their commitment to society lies the prospect of real human advance, and who are prepared to respect in others the same commitment, even if, as sometimes happen, they happen to find themselves on opposite sides in the external dialectics of democracy."

Constitutions are always in a process of continuous change, perhaps not so much through formal amendments as by subtle changes of emphasis and perspective. Life does not stand still. Nor do the constitutions. The forces of life give meaning and content to the words used in constitutional documents while

the written injunctions of the laws and the constitutions contain and canalise the forces of life. In that wider perspective of the changing content of the constitutions, one sees the formal amending process as only the most visible part of the iceberg. Formal constitutional amendments merit particular

attention because they represent either significant points of departure or the more notable episodes of elucidation or rectification. In either event, a constitutional amendment represents the infusion of contemporary urges, exigencies and expediences into the organic law.

INDIAN CONSTITUTIONALISM AND CONSTITUTIONAL AMENDMENTS

L. M. SINGHVI

THE celebrated controversy which began with the decision of the Supreme Court of India in the case of *Golak Nath* (February, 1967) and which gave rise to a widespread national debate highlighted the importance of the amending power. The *Golak Nath* decision did not help the petitioner in any way and brought him no relief, but the answers put forth by it posed certain fundamental constitutional questions before the country. The Twentyfourth Amendment of the Constitution and the decision of the Supreme Court in *Kesvanand Bharati's* case sought to resolve those questions of constitutional jurisprudence with answers substantially different from those enunciated in the *Golak Nath* decision. Perhaps the last word on the far-reaching cluster of issues underlying the controversy has not yet been said. The remarkable feature of that fierce controversy, however, was that Indian polity endeavoured to feel its way towards viable answers through the dialectics of legislative and judicial exertions within the framework of our constitutional democracy.

The founding fathers of the Indian Constitution wrote a lengthy document purporting to express their intentions elaborately and in explicit terms. A quarter century of the constitutional history of India, however, demonstrates that even the most elaborate and explicit constitutions cannot foreclose and forestall constitutional controversies in a living system and a free society. Obviously, written constitutions can do no more than lay down the basic principles and the broad framework. It is in the clash of interests and in the contexts of specific issues and conflicting contentions that the written words of a constitution are placed in battle array. Article 368 of the Constitution exemplifies that situation.

The language of the original Article 368 of our Constitution was not shrouded in legal mystery. It looked simple and clear to the draftsmen and the early exponents of the Constitution. But when the amend-

ing power was used and the amendments affected rights and interests of citizens, the question arose whether Article 368 was itself not subject to the injunctions of Article 13 of the Constitution and whether Article 368 contained the amending power or merely provided the procedure for amendment.

Apart from the question of the amendability of fundamental rights, the procedure for constitutional amendment contained in Article 368 is highly flexible except when an amendment seeks to make any change in respect of certain entrenched provisions relating to the federal structure and the amending provision itself. In respect of the entrenched provisions, a specific requirement of ratification by the legislatures of not less than one-half of the States is stipulated. Thus, so far as the ordinary procedure for the amendment of the Constitution is concerned, an amending Bill is required to be passed in each House by a majority of the total membership of that House and by a majority of not less than two-thirds of the members of that House present and voting. The proviso which requires the ratification by legislatures of not less than one-half of the States applies to amendments seeking to make any change in:

- (a) Article 54, Article 55, Article 173, Article 162 or Article 241, or
- (b) Chapter IV of Part V, Chapter V of Part VI or Chapter I of Part XI, or
- (c) any of the Lists in the Seventh Schedule, or
- (d) The representation of States in Parliament, or
- (e) the provisions of Article 368.

The Federal Character

As Dr. Ambedkar put it in the Constituent Assembly:

"If Members of the House who are interested in this matter are to examine the articles that have been put under the proviso, they will find that they refer not merely to the Centre but to the relations between the Centre and the Provinces. We cannot forget the fact that while we have in a large number of cases invaded provincial autonomy, we still intend and have as a matter of fact seen to it that the federal structure of the Constitution remains fundamentally unaltered."

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It would thus appear that the founding fathers were anxious to protect the limited federal provisions of the Constitution from easy amendment; if the pre-Golak Nath view is accepted, their lack of equal solicitude for fundamental rights guaranteed by the Constitution in unmistakable terms and as its sheet-anchor is no doubt highly anomalous. It is this anomaly which makes the doctrine of the amendability of fundamental rights under the ordinary procedure of Article 368 logically vulnerable. On the other hand, the "transcendental" doctrine of the immutability of Part III of the Constitution is difficult to sustain, philosophically as well as historically. It is well to remember that so far as the intentions of the Constitution-makers are concerned, it was substantially the same Constituent Assembly which functioned as the Provisional Parliament and enacted the first Constitutional Amendment in 1951.

The decision of the Supreme Court in *Keshavanand Bharati's case* (overruling the earlier decision in the *Golak Nath case*) seeks to strike a new constitutional balance by holding in effect (by a wafer thin majority!) that though Parliament is entitled to abridge any fundamental right or amend any provisions of the Constitution, the Parliament has no constitutional power to alter or eliminate the basic structure or framework of the Constitution. On the majority view, every constitutional amendment, to be valid, would have to pass the crucial test that it does not alter the basic structure or framework of the Constitution. It was on the application of this test by Mr. Justice H.R. Khanna (the thirteenth judge whose judgment became decisive as the rest of the Court was equally divided) that the validity of Article 31 C (inserted by the twenty-fifth Amendment) was upheld and the latter part of Article 31 C (ousting the jurisdiction of the court) was declared to be void.

The Impress of Experience

During the quarter century of our Constitution, there have been as many as thirtyfour amendments and there are four more officially sponsored amendments which may before long become a part of the Constitution. Critics complain that the profusion of amendments evidences a casual attitude to the Constitution, and that the amending power has been used to "deface" and "defile" the Constitution. Some have gone to the extent of saying that frequent and prolific amendments have so changed our Constitution that it has now become a substantially different document. Obviously those are highly exaggerated conclusions. A close scrutiny of the constitutional amendments would show that the bulk of them were necessitated by the exigencies of circumstances. For example, the Second Constitutional Amendment passed in 1952 amended Article 80 (1). The original Article 80(1)(a) provided for an absolute limit of 500 elected members in the Lok Sabha and Article 81(1)(b) enjoined that the States should be divided into territorial constituencies to be represented by members in such a way that there would be not less than 7.5 lakhs of the population in each constituency. Certain changes were inserted in order to take into account the increase in the population in 1951 census. The Second Amendment however proved to be futile, and this is evidenced by the Seventh Amendment which amended Article 81(1)(b). The Fifth Amendment amended the proviso to Article 3 to the effect that the President may prescribe a period within which the State had to express its views on a Bill.

The Sixth Amendment was passed only to elucidate the scope and effect of the explanation in Clauses 1 and 2 of Article 286. The Seventh Amendment translated

some of the recommendations of the States Reorganisation Commission and purported to recast certain entries in the Seventh Schedule. The Eighth Amendment (1960) amended Article 334 so as to extend the operation of that Article from 10 to 20 years from the commencement of the Constitution with regard to the reservation of seats for the Scheduled Castes and the Scheduled Tribes in the House of the People and in the Legislative Assemblies of the States and the representation of the Anglo-Indian Community in the House of the People and in the Legislative Assemblies of the State by nomination. The Ninth Amendment of the Constitution was passed to give effect to the conclusion arrived at by the Supreme Court in its advisory opinion on the cession of a part of the Berubari Union No. 12, which was Indian territory, to Pakistan and the exchange of certain Enclaves with Pakistan. The Tenth Amendment amended the First Schedule to the Constitution so as to include Dadra and Nagar Haveli under the heading "the Union Territories". The Eleventh Amendment amended Articles 66(1) and inserted clause (4) in Article 71. The Twelfth Amendment was enacted to include the former Portuguese territories of Goa, Daman and Diu in the First Schedule to the Constitution as Union Territories.

The 13th Amendment was to give effect to an agreement between the Government of India and the leaders of the Naga People's Convention. The Fourteenth Amendment enacted in 1962, added Pondicherry as a Union Territory, again amended Article 81 and the Fourth Schedule to provide for the representation of the erstwhile French territories in both the Houses of Parliament. Article 239A was inserted to empower Parliament to create local legislature or Council of Ministers or both for the Union Territories of Himachal Pradesh, Manipur, Tripura, Goa, Daman and Diu, and Pondicherry. The Fifteenth Amendment raised the age of retirement of High Court Judges from 60 to 62; it also provided for the determination of any question as to the age of a Judge of the Supreme Court of the High Court. The Fifteenth Amendment also added Clause (1A) to Article 226 with a view to confer jurisdiction on all the High Courts where the cause of action arises notwithstanding that the seat of the Government or the authority against whom a writ or a direction is sought is not within the territories of those High Courts. The Eighteenth Amendment registered the bifurcation of the erstwhile State of Punjab and the establishment of the new States of Punjab and Haryana and of the Union Territory of Chandigarh. The Nineteenth Amendment changed the system of hearing election disputes and provided for the trial of an election petition by the High Court and a first appeal to the Supreme Court of India. The Twentieth Amendment sought in effect to validate certain appointments of District Judges which were held to be illegal by a judgement of the Supreme Court. The Twentyfirst Amendment added the Sindhi language to the Eighth Schedule in the Constitution. The Twentysecond Amendment provided for constituting within the State of Assam an autonomous state comprising certain specified areas.

The 23rd Amendment provided for the extension of the period of reservation for Scheduled Castes and Scheduled Tribes and Anglo-Indians for a further period of 10 years. The Twentysixth amendment omitted Articles 291 and 362, amended Article 366 and inserted a new Article 363A with a view to terminate the privy purses and privileges of the Rulers of former Indian States. The Twentyseventh Amendment includes the Union territory of Mizoram in Article 239A and confers on the Administrator of a Union territory the power to promulgate Ordinances. The Twenty-

eighth Amendment omitted Article 314 which provided for the protection of existing officers of certain services such as the Indian Civil Service and added a new Article 312A which empowered Parliament to vary or revoke conditions of service of such officers and ousted the jurisdiction of the Supreme Court or any other court in respect of disputes arising out of conditions of service of such officers. The Twentyninth Amendment immunised the Kerala Land Reforms Acts of 1969 and 1971 by placing them in the Ninth Schedule. The Thirtieth Amendment Act gave effect to the recommendations of the Law Commission of India on the question of Civil Appeals to the Supreme Court. The Thirty-first amendment inter alia increases the upper limit for representation of States in the House of the People to 525 and brings down the upper limit for representation of Union Territories from 25 to 20. The Thirtysecond Amendment amends Article 371 and the Seventh Schedule and inserts new Articles 371D and 371E in order to create the requisite constitutional sanction for giving effect to the Six Point Formula in Andhra Pradesh. The Thirtythird Amendment seeks to amend Articles 101 and 190 so as to empower the presiding officers of the Houses of Legislatures at the Centre and the States not to accept the resignation of a legislator if such resignation is not voluntary or genuine. The Thirty-Fourth Amendment adds some twenty State enactments relating to land reforms to the Ninth Schedule in order to protect them from any constitutional challenge to their validity.

The Constitution (Thirtyfifth Amendment) Bill, 1974 was passed by the Lok Sabha on September 4, 1974 and by the Rajya Sabha on September 7, 1974. This Bill provides for the terms and conditions of association of Sikkim with the Union of India. Under the Proviso to Article 368, the Bill, as passed by the Houses of Parliament, has been referred to the State Legislatures for ratification. There are two Amendment Bills (introduced as Twenteighth and Twentyninth Amendment Bills in 1971 and 1972 and to be renumbered when passed) pending before the Lok Sabha. The former seeks to amend the provisions of Article 352 to clarify that the President may, if he is satisfied, make a declaration of emergency restricted in scope to such part of the territory of India as may be specified in the Proclamation. It also seeks to empower the President to vary a Proclamation of Emergency by a subsequent Proclamation. The latter Amendment Bill seeks to amend the second proviso to Article 31A to clarify that the ceiling limit on land mentioned therein refers not only to the limit originally fixed under the State law but also such limits as may be fixed from time to time by any such law as subsequently amended. Another Bill, introduced as the Thirtysecond Amendment Bill, (1973) is pending before a Joint Committee of Parliament. This bill is designed to deal with the problem of defections; it also seeks to provide that the Prime Minister and the Chief Ministers shall be members of the directly elected Houses (Lok Sabha and Vidhan Sabha).

It is clear that most of our constitutional amendments are in the nature of responses to developing situations. Most of them were made to clarify, to elucidate to rectify or to provide for the reorganisation of States or the addition or association of territories. Some of the amendments were necessitated by judgements of Courts. Most of the amendments are beyond any serious partisan controversy although the need for them or the precise form or manner in which they were brought forth have been subject to differences of opinion.

It is however true that amendment such as Twenty-fifth Amendment stands on a different footing and reflects a shift from liberal ideas to radical intentions. The Twenty sixth Amendment which brought to an end the privileges and privy purses of the Rulers of former Indian States illustrates one of the thrusts of the radicalism of 1971. The Twenty fourth Amendment showed the anxiety of the Parliament to assert its superiority and to proclaim itself the master of the amending power. While the amplitude of the amending power with which the Twentyfourth Amendment purports to clothe the Parliament is unlimited and uncharted, the Supreme Court in its interpretation of the Twenty-Fourth Amendment laid down that the Parliament has no constitutional warrant to alter or eliminate the basic structure or framework of the Constitution. What the Twentyfourth Amendment will unfold and how its interpretation by the Supreme Court will operate, would be a matter of speculative guess work. But it does seem that by and large the amending power has not been used so far to impair the basic framework of the Constitution or to change its essential characteristics except perhaps in respect of the right to property, and particularly in the matter of land reforms and nationalisation of certain industries. Perhaps, it can be said with justification that the Constitution was framed in full recognition of the crying need for land reforms without the State having to pay equivalent compensation. Equally, the Constitution in its original form had anticipated that the State would have to embark on programmes directed towards securing the objectives embodied in Article 39 (b) and (c) which enjoins as follows:—

“The State shall, in particular, direct its policy towards securing... (b) that the ownership and control of the material resources of the community are so distributed as best to subserve the common good; (c) that the operation of the economics system does not result in the concentration of wealth and means of production to the common detriment;”

Essentially the constitutional foundations of the Indian Republic remain intact even though superstructures have been altered from time to time and occasionally even a pillar taken out and replaced. The fabric of fundamental rights remains; so does the power of the courts to enforce them, except in respect of certain rights to property. Basically, the constitutional amendments have not eroded the efficacy or corroded the core of our Constitution.

Constitutionalism in our country is under a cloud because of the short-comings in the political system as we operate it and because of a concentration of economic crises. Liberty is still the key-stone of our Constitution and in the long run the egalitarian urges are capable of being used for reinforcing rather than destroying freedom and liberty in their true and intrinsic sense. What is more, in an ultimate sense, as Judge Learned Hand said: “Liberty lies in the hearts of men and women; when it dies there, no constitution, no law, no court can save it; no constitution, no law, no court can even do much to help it.” The controversies on the amending power would not have been in vain if we learn the enduring value of synthesizing individual freedom and social control and of weaving a fabric of life the warp and woof of which are liberty and equality. □

MAJOR PORTS: STRATEGY

THE concept of a modern port is much wider than what it connotes in common parlance including its sophisticated installations, labour-saving and speed generating equipment and all. A port cannot exist without an economic base, and that base consists of its vast hinterland humming with productive activity of diverse kinds, sustained by its natural and human resources and—no less importantly—by an efficient network of roadways, railways (and waterways) to and from the port. It is therefore needless to repeat the truism that ports are the gateways to a country's commerce, both domestic and international. The enormous sums spent on the improvement of existing ports and the construction of new ones are a measure of the growing importance of commerce to the economic well-being of a country. Port organization, management and operations have become so highly sophisticated now that no developing country, however vast its problems of growth, can afford to ignore this basic factor in the infrastructure of its economy.

Carriers, we all know, do not make a distinction between the ports of call of the affluent and the poorer countries. The modern cargo-carrying ships are often enormous in size and it is becoming increasingly expensive to operate cargo ships of smaller tonnage. Correspondingly the trend is in favour of deep-sea ports equipped with facilities to load and unload cargo with the utmost speed. Every hour of idle wait at the port or delay in the handling of its cargo would mean irrecoverable loss to the carriers, and if a poor country is too poor to improve its port facilities, it has to pay an uneconomic price for what it imports or exports.

What have we done in the last 25 years to tackle this problem? There is both a plus and minus side to the

balance sheet but happily one which we need not be apologetic about. We have around 200 ports dotting a coastline of over 6000 kilometres. Of these, ten have been declared as major ports and as such their development and administration are the responsibilities of the Union Government. At the time of Independence, India had only four major ports and each of them had developed very slowly, almost imperceptibly over a period of about a century, to cater to the limited needs of a colonialeconomy whose commerce consisted of exports of raw materials and imports of manufactured goods. Port-development is highly capital intensive and heavy investments on port installations are not undertaken without an eye on the cost-benefit ratio. This is so in a free country which is the master of its own destiny. It was even more so during the colonial era when the economy was characterised by near stagnation.

The situation is vastly different today. In the last 25 years the total quantity of cargo handled at India's ports has increased four-fold from 16.3 million tonnes to about 64.3 million tonnes. The Union Government has invested since 1948 a sum of Rs 630 crore (approximately Rs 1000 crore at the 1974 prices) in the improvement of its harbours, their installations and cargo-handling capacities. Industrial/mining complexes have been developed in the hinterlands of these ten ports to an extent that could not have been foreseen forty years ago. In the process of this development, the engineers and administrators of our ports have reaped a rich harvest of technical expertise, enough to handle with confidence new and bigger tasks of construction, maintenance and operation.

Those who may feel inclined to be impatient about the pace of growth in our ports would do well to remember

OF DEVELOPMENT

that a harbour, unlike a factory or a farm, does not produce wealth. A port is a service facility and investment in it would have to be proportionate to the cargo and passenger traffic passing through it or is likely to pass through in not too distant a future. Money spent on port installations must be justified by a realistic cost-benefit analysis. Otherwise it would be like building an impressive railway station at a place where terminal traffic is negligible. One has to look for optimum benefits from any investment in costly installations. But where facilities are obviously inadequate even to handle the normal traffic, temporary, short-gap measures are available till a permanent remedy is found. Therefore, the principle behind any sensible strategy for port development is to provide facilities by stages to keep pace with the growing volume of ship movements. Auxiliary equipment such as barges and lighters are always provided to handle emergency situations. Any long-range plan for port development would have to include navigational aids besides port facilities. All this would necessarily add up considerably to expense.

Port conditions in India, as elsewhere, vary considerably and solutions for each would have to be correspondingly versatile. We have purely artificial harbours like Madras and a great riverine port like Calcutta which is afflicted with the problem of siltation. Kandla and Tuticorin are new major ports, each with its peculiar problems. The future of each port is again being determined by the pace of industrial development taking place in the hinterland which is not uniform. In the process of finding solutions to the many problems of our major ports we cannot strictly go by the norms set by the ports of the very advanced countries. They grew as an organic part of their economies which had all

the time in the world to determine their own pace. We, on the other hand, are seeking to telescope decades into years with all the disadvantages of competition and inadequate resources for investment. In the short run therefore India would have to take recourse to better management practices, simple legislation and streamlining the administration and operation of the ports to obtain optimum results even with the existing level of facilities. The three principal objectives of port administration are, and will ever be, satisfaction to vessel operators, the labour force and the general public. These are perhaps more easily stated than achieved. The only precondition for the achievement of this objective is the unquestioned competence of men in executive and administrative positions and India, fortunately, does not suffer from a dearth of such persons. We need, too, a dedicated labour force whose leadership is in the hands of men of vision and who have a stake in the smooth and efficient working of our ports.

In this exciting, fast changing world of technology the world is perhaps heading to an era when ports will cease to be focal points of international commerce and business activity and function only as links in a complex, overall system of transportation. The revolution that has brought into being containerised and transmodel shipping is gradually diminishing the importance of ports. To a developing country like India the future, even more than the present, should be of vital concern if our limited resources have to be invested for maximum advantage. So, when we embark on plans or acquisition of costly facilities and equipment we should provide liberally for meeting changing conditions with minimal effort and cost. Productivity, rather than over-building, shall have to be the motto. This

derives from the fact that over 70 per cent of India's export trade goes to the more developed countries. As a growing maritime nation which India is, she has to share in the current revolutions in cargo-handling. Ours is a battle of survival in a world in which

technology is overtaking the pace of our development.

'Yojana' is happy to present through this issue, brief accounts of our major ports in the authentic words of men who are in charge of their development. □

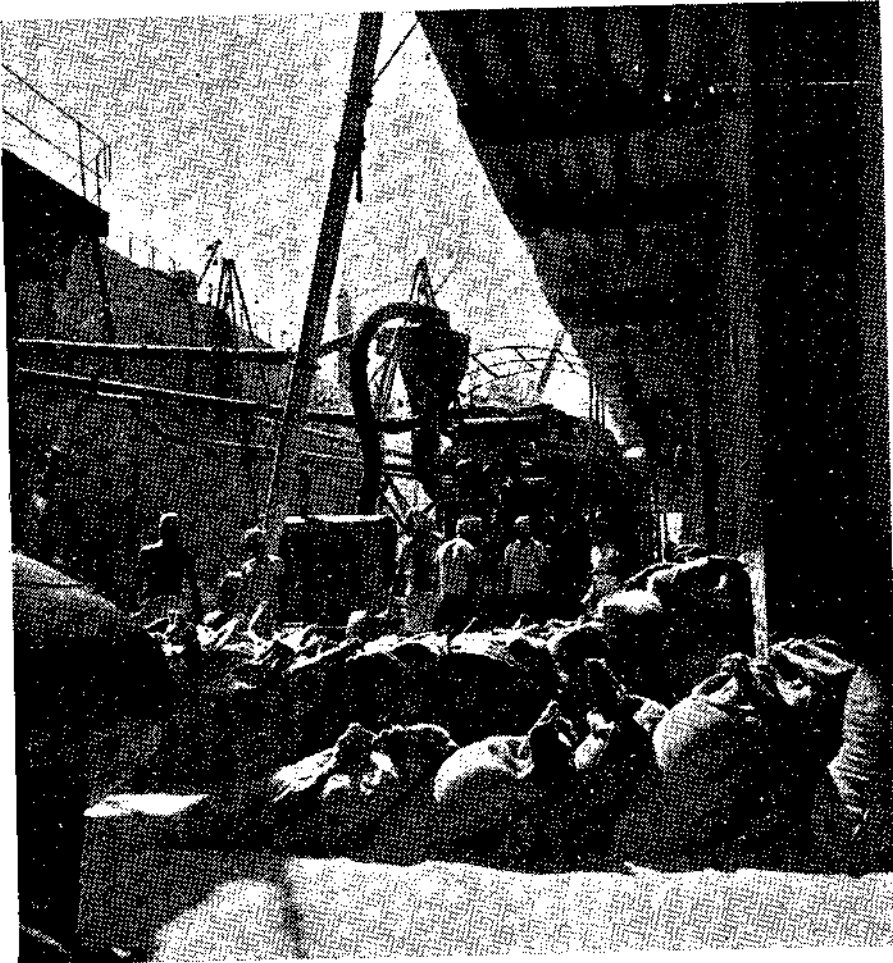


**Our
Major
Ports**

BOMBAY— the Gateway that has grown small

In three years from now the port may have to add over 50 per cent to its present handling capacity. Besides, the port's development plan has to provide for accommodating ships and tankers of far larger size than ever before. The development of Nhava Sheva as a satellite port is the only practical way to provide for this growth of traffic. The fast growing economy of Bombay's hinterland makes this investment imperative.

L. D. GOKHALE



BOMBAY, traditionally known as the "Gateway of India" is the largest and centrally located port on the West Coast of India connected by rail and road with all parts of India. One of its great advantages is that it is the nearest Indian port to the Suez Canal, an asset which has made it the premier port of India. In recent years, however, with the growth of other major ports and the diversification of India's trade into new markets, Bombay has steadily been losing this premier position. This is both a natural and inevitable consequence of the rise of Kandla and Mangalore ports to the status of major ports. Even so, Bombay continues to be a leading port, handling, as it does, 45 per cent of India's oil traffic, with Cochin coming next with 16 per cent (1971-72). Bombay is also the leading General Cargo port,

Shri Gokhale is Additional Chief Engineer, Bombay Port Trust.

YOJANA

accounting for 44 per cent. Calcutta comes next with 30 per cent. Bombay is still the leading port for the import of food-grains, accounting for 29 per cent of the traffic during peak years of imports, and it continues to play a leading role in overseas passenger Traffic.

Bombay started being developed as a port when the East India Company's Headquarters was shifted from Surat to this place in 1672. In 1858, the British Crown assumed responsibility for the territories formerly administered by the Company and thereafter, for a little over a decade, its development was in the hands of private companies. The Bombay Port Trust was authorised in 1869, but the Act constituting the Trust was not passed until June 1873. Thereafter, the development of the port was carried out systematically, without interruption, by the Port Authorities. The Bombay Port Trust completed 100 years of its existence in June 1973 and is now poised for new development and growth.

Prince's Dock with single gate entrance of 20.1 M. width was constructed and opened to traffic in 1880. Available draft in this dock is 6.4 M. The Victoria Dock was completed in 1888. It has a single gate entrance of 24.4 M. width, and can cater for ships of 7 M. draft. Ships of only 5,000 DWT can be catered for in the Prince's and Victoria Docks.

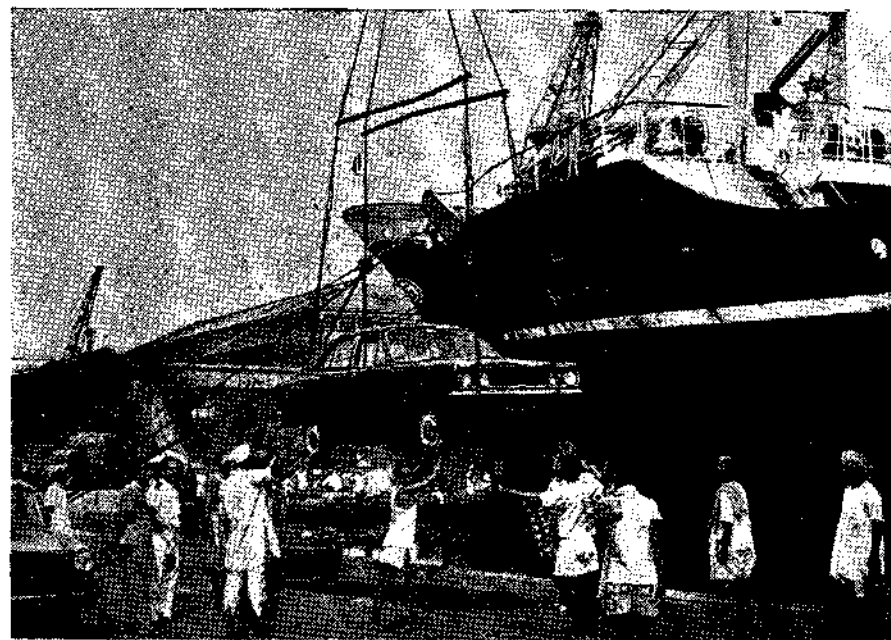
At the turn of the 19th Century, the need for more and better port facilities was keenly felt. The Suez Canal had been deepened to 9.1 M. depth, and longer and deeper draft vessels started coming into vogue. The Alexandra Dock (now Indira Dock) commissioned in 1914 is entered through a lock entrance of 30.5 M. width and 228.6 M. length. Ships of 10.36 M. draft and 22,000 DWT can at present be accommodated in Indira Dock. In 1922, an Oil Pier at Pir Pau was constructed, which could cater for oil tankers of 170.7 M. length and 8.8 M. draft. In 1954, 3 berths at Butcher Island were constructed to cater for tankers of 198.12 M. length and 10.36 M. to 10.97 M. draft. These Butcher Island jetties are connected to the Refineries of M/s. Burmah-Shell and M/s. Hindustan Petroleum Corporation Ltd. at Trombay by means of sub-marine pipelines. Berth Nos. 1 & 3 at Butcher Island were upgraded in 1969 to receive tankers of 53,000 DWT as against 32,000 DWT, for which these were originally designed.

A need for additional berthing facilities had become urgent by the early sixties. The Dock Expansion



A view of Bombay Port

Unloading automobiles



Scheme was sanctioned in 1962 to extend the eastern arm of Indira Dock to provide four berths of 182.88 M. length each shifting of ferry traffic to Harbour Wall of Prince's Dock, thereby releasing 3 deep water berths from Indira Dock Harbour Wall and construction of an island jetty, off Prince's Dock. The scheme also included construction of a passenger terminal at Ballard Pier by extending the existing berth by 243.84 M. Marine works of the scheme were substantially completed in 1969 and Ballard Pier was commissioned in 1972.

Facilities now available for handling general cargo traffic in Bombay comprise 27 berths in Indira Dock, and 21 berths in Prince's & Victoria Docks. Apart from this, there are three berths of Marine Oil Terminal at Butcher Island and one oil pier at Pir Pau. These four berths cater for P.O.L. traffic. To cater for passenger traffic, two berths are provided at Ballard Pier. In addition, there are numerous *bunders* to serve mainly sailing vessels:

The following investments were made by Bombay Port Trust in four Five Year Plans and there Annual Plans upto 31.3.1974:

**Actual expenditure
(Rs in crore)**

First Five Year Plan (1951-52 to 1955-56)	10.92
Second Five Year Plan (1956-57 to 1960-61)	5.22
Third Five Year Plan (1961-62 to 1965-66)	12.94
Annual Plans	
1966-67	4.39
1967-68	5.60
1968-69	9.01
Fourth Five Year Plan	17.02

65.10

The principal objectives of the first two plans were to rehabilitate the harbour after the war and to provide for the maintenance and working of existing port facilities with maximum efficiency. There had been severe congestion at the port between 1947-49 due to increasing traffic and workers' strikes. In this period there were also heavy imports of foodgrains and of iron and steel materials required for the development projects undertaken by the Government. Third Five Year Plan aimed at adding to the capacity of the port as the existing facilities were severely strained and there was chronic congestion in the docks.

In December 1960, the Government of India, with expert advice from U.N., examined the Dock

Development Scheme of Bombay and Calcutta. The International Development Association sanctioned a loan of 18 million dollars to the port for the Dock Expansion Scheme and allied works which included expenditure on a Master Plan for the port. The Dock Expansion and Ballard Pier Extension, costing Rs. 23 crore, was taken up in 1965 and the main marine works were completed in 1969. The Ballard Pier Extension was commissioned in 1972.

The normal capacity of handling general cargo in docks is accepted at the berth occupancy of 75 per cent to 80 per cent. Prior to the execution of Dock Expansion Scheme, the capacity of Indira, Prince's and Victoria Docks was 5.5 million tonnes per annum. On completion of the scheme, the capacity of these docks has increased to 6.60 million tonnes. The *bunders* can handle about 0.7 to 0.8 million tonnes of cargo in sailing crafts making up a total of about 7.4 million tonnes for handling dry cargo. Existing Butcher Island berths can handle about 9.00 to 9.50 million tonnes of traffic per annum bringing up the existing total capacity of Bombay Port to about 17.00 million tonnes. This capacity includes 2.00 million tonnes allowed for the Prince's and Victoria Docks which can cater for ships of only 5000 DWT size and 6.4 to 7.0 M. draft. These docks are becoming obsolete due to the larger size of ships being used even for coastal traffic. The Bombay docks are so intensively used that there is no reserve capacity left. As a result there was severe congestion in the docks from time to time. The loss of ship days in the harbour by ships waiting for berths has become a common feature. In the 12 year period 1962-63 to 1973-74, a total of 38,545 ship days (dry cargo) and 5,977 tanker days were lost by ships and tankers waiting for the berth. At the rate of Rs. 15,000 per ship-day for dry cargo and Rs 30,000 per tanker-day, the loss to shipping amounted to about Rs 76 crore! This amount is paid mostly in foreign exchange and is a drain on the foreign exchange resources of the country.

A Port Sub-Committee of the Steering Group appointed by the Planning Commission recently to examine the Fifth Five Year Plan envisaged a total traffic of 22.15 million tonnes in 1978-79. Subsequently, the traffic projections of P.O.L. have been revised by the Ministry of Petroleum & Chemicals, and they have indicated that due to

expansion of Bombay Refineries Bombay Port will have to handle by 1978-79, 8.75 M.T. of crude and 3.50 M.T. of products, making a total of 12.25 M.T. per annum. Thus, the traffic which Bombay port will be called upon to handle by 1978-79 will be about 25.00 M.T. per annum. Capacity of the port to handle traffic—dry as well as P.O.L.—is now of the order of about 17.00 M.T. and therefore, in order to cater for the traffic to the extent of about 25.00 M.T., it will be necessary to augment substantially the port's capacity.

Of the traffic handled by Bombay Port in the last five years, food, rock phosphate, sulphur, fertilizers (excluding urea), clinker, salt and ore were in bulk and constituted about 80 per cent of the dry cargo. These commodities, however, are not handled in bulk in the sense in which bulk handling is ordinarily done. They are handled by quay cranes and the work is carried out manually. Sugar and oil-cake are handled in bags. Only food is unloaded by pneumatic evacuators.

Additional Traffic

Expansion of the Port of Bombay is necessary to cater for additional traffic which the port will have to handle and also to accommodate ships and tankers of larger size than are now coming into vogue. At present, the largest size of dry cargo ship, which can be handled is about 22,000 DWT in Indira Dock and tankers of 53,000 DWT can be handled at the Butcher Island.

Bulk carriers which are single deck vessels designed to carry dry cargo were plying in small numbers in sea trade at the beginning of this Century. With the development of more rapid mechanical handling equipment within ports, the bulk carriers became more competitive and the way was made clear for larger vessels. The increase in size and number of vessels designed for dry bulk trade occurred in the last two decades carry a wide range of commodities (grain, coal, ore and oil), are naturally more flexible in use and can avoid long journeys in ballast. Bulk carriers of the size of 60,000 to 1,00,000 DWT would be best suited for handling coal, grain, fertilizers and fertilizer raw materials, sugar, oil cake, etc. Ore carriers would be larger in the range of 1,00,000 to 2,00,000 DWT. For transporting crude oil and products, the size of tankers of 80,000 to 1,00,000 DWT are common but larger tankers of 2,50,000 to 3,00,000 DWT would ply between those ports which can cater for such tankers or

at off-shore terminals. Ships for handling unit-loads like fully palletised ships, cellular container ships and lash (lighter aboard ship) are being built and require special handling facilities. A container berth requires about 30 acres of back-up space for efficiently handling containers. Bulk handling also requires large back-up space for sheds and silos as well as for roads and railway tracks.

Obsolete Docks

Prince's & Victoria Docks built late in the last century are fast becoming obsolete. In U.K., old docks built about this time are being filled up and the land used for other purposes. Indira Dock was planned in 1905 and commissioned in 1914 and is still good for general break-bulk cargo but it cannot handle even smaller size bulk carriers and container ships due to limitation of back-up space and difficulty of installing large size mechanical equipment. The existing roads serving the docks are highly congested and cannot carry any extra traffic. Recognising the growing problem of road transportation in the city of Bombay, the Government of India, the Government of Maharashtra and the Greater Bombay Municipal Corporation jointly sponsored a Bombay Traffic & Transportation Study in 1962 by M/s. Wilbur Smith & Associates. They recommended construction of West Island & East Island Freeways and connectors. East Island Freeway is expected to give relief to the traffic on P.D'mello Road. The Scheme has not been, however, taken up so far by the State Government. The Trustees of the Port of Bombay recorded in their minutes while sanctioning the scheme of the Dock Expansion in 1962 that the existing roads and trunk railways of Bombay were very severely strained and for future expansion of the port, we would have to look for a suitable site on the other side of the harbour on the mainland.

Nhava-Sheva as Satellite Port

With shallow mud-flats lying close to the north of Prince's Dock and Naval Dockyard located immediately to the south of Ballard Pier, there is no prospect of any lineal expansion of existing dock systems. Among the possible sites, the Nhava-Sheva area has been found to be the most suitable, where berths to accommodate ships drawing water upto 13.00 to 13.5 metre draft can be provided. A vast area immediately behind the proposed site on the mainland is available for port instal-

lations and facilities as well as for port-based industries and Free Trade zone. Diva-Panvel-Uran railway line and also the Panvel-Uran road pass within 8 kilometres from the site making it possible to provide rail and road connections from the port site to the hinterland conveniently and economically. Electric power and water supply at the new site pose no problem. The Maharashtra State Electricity Board are planning installation of 4 units of 500 megawatt each in their proposed Thermal Power Station at Nhava-Sheva.

Minimum traffic which has been accepted for the Satellite Port at Nhava-Sheva was discussed with the Planning Commission, who have accepted a total capacity of 5.10 M.T. for 1978-79.

The Port Trust prepared a scheme for the development of Nhava-Sheva in 1971 which provided for the construction of three berths in a tidal basin, one berth for handling in ports of fertilizer & fertilizer raw materials, one for export of sugar and oil cake and the third one for handling containers. This scheme was estimated to cost Rs. 51.74 crores exclusive of cost of the main channel from the entrance to harbour to the Butcher Island. The cost of the scheme at 1973 prices with the cost of the main channel included in it, works out to Rs 73.00 crore. The coal berth which was not originally included in 3 berth scheme may cost an additional Rs. 10 crore. Ships of 65,000 to 80,000 DWT and draft of 13.00 M. can be thus accommodated.

The viability of the 1971 scheme has been examined on the basis of national benefits accruing to the economy. The benefits that would be derived by the shipping trade and industries and also by the community will be due to reduction in shipping/freight costs, quick turn-round of ships, and reduction in waiting cost.

It is estimated that the saving in freight and reduction in demurrage cost would be of the order of Rs 15.00 crore per annum at the meagre traffic of 2.6 million tonnes of fertilizers and fertilizer raw materials, sugar, oil cake and containers. Freight reduction on account of handling coal would be of the order of Rs 2.5 crore on a traffic of 2.5 million tonnes. These estimated benefits give a first year rate of returns on investment of over 20%. Benefits would further increase as traffic increases. The three berths scheme has a capacity to handle 5.10 million tonnes of traffic.

Apart from the above quantified benefits, there are other unquantified benefits like reduction in traffic, congestion in the city of Bombay, potential for industrial development in New Bombay, reduction in internal transport cost due to reduction in distance between the port and hinterland.

To cater for the increase in P.O.L. traffic, the Port Trust has prepared a scheme for the construction of super oil tanker berth at Butcher Island. The joint exercise was carried out by the Port Trust and the Shipping Corporation of India which established that the optimum size of the tanker for which the scheme should be designed is about 80,000 DWT and 12.7 M. draft. This size is determined by the overall economy from the point of view of first and recurring cost to the port as well as shipping. The benefits of this scheme would be:

(i) *Reduction in sea-freight* due to use of oil tankers having a parcel size of about 75,000 tonnes as against 53,000 tonnes. This will give a saving of Rs 4 crore per annum on a traffic estimate of 8.75 million tonnes/annum of crude oil.

(ii) *Reduction in detention to oil tankers*—This is estimated to reduce the losses by Rs 3.25 crore annum.

Thus the total benefits would be Rs 7.25 crore, which give a first year rate of return of 30 per cent.

Investment of Future Growth

In the first 23 years of planning ending in March, 1974, the Bombay Port Trust invested an amount of Rs 65.10 crore in the development works. They have proposed in the Fifth Five Year Plan an outlay of Rs 85 crore for spill-over and New Schemes which includes allocation of Rs 43.00 crore for Nhava-Sheva, 26 crore for improving oil handling facilities and constructing a bridge connecting Butcher Island with Trombay and 16 crore for other works comprising replacement of flotilla, construction of warehouses, reconstruction of old transit sheds, housing and other miscellaneous works. The port proposes to provide about Rs 40 crore from their own resources.

It is essential that the capacity of the Bombay Port should be augmented very early and substantially to handle both dry cargo as well as POL traffic in order to enable it to keep abreast in facilities and serve the economy of the hinterland. Bombay has a highly developed hinterland which requires facilities of deep water port for their import and export.



The Calcutta—Haldia Complex

A great port with a colourful history, Calcutta's problem is mainly the problem of the Hooghly which is being choked with silt. The Farakka Barrage will give new life to this dying but strategic port and what threatened to be a disaster is now being transformed into an achievement.

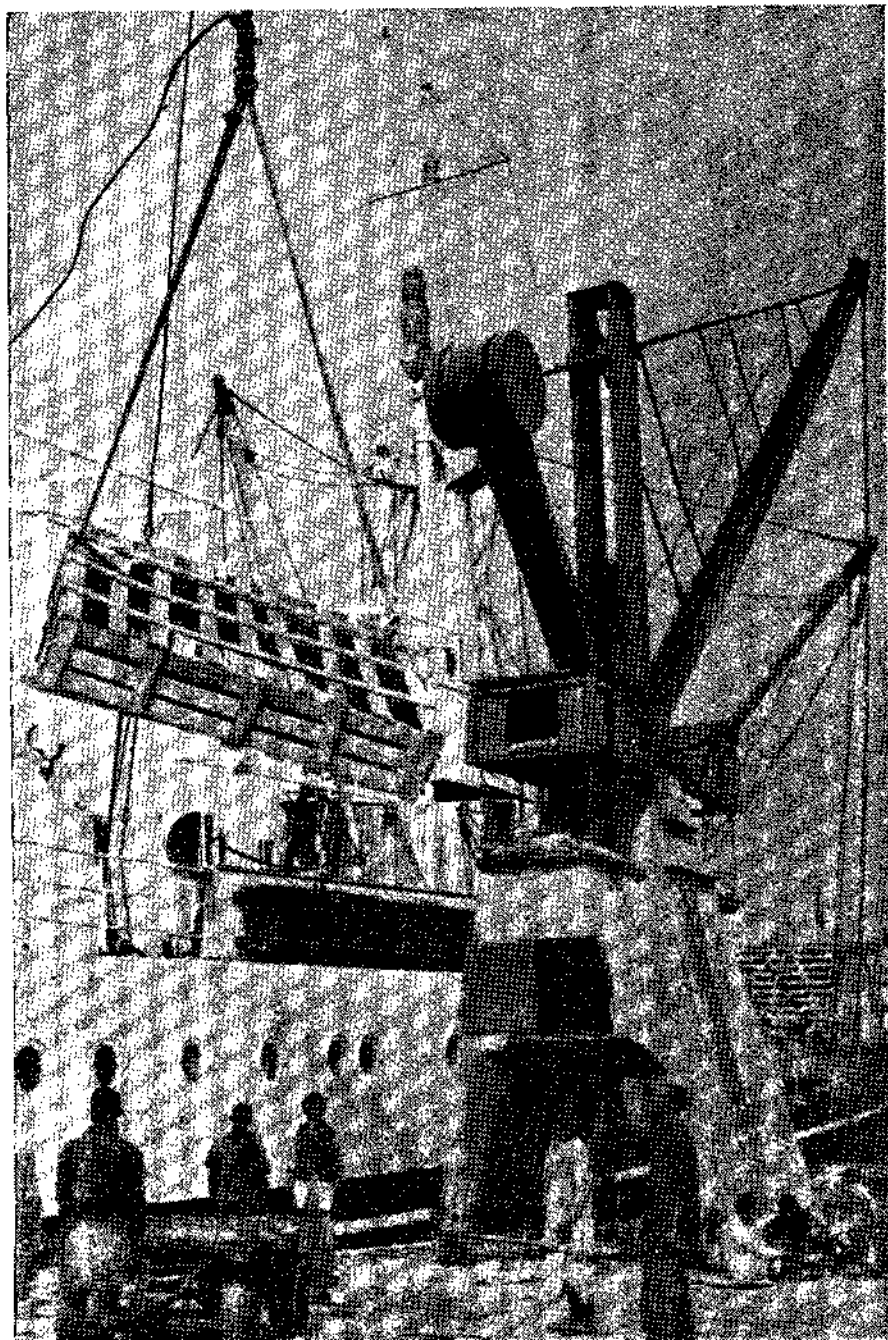
P.C. MITRA

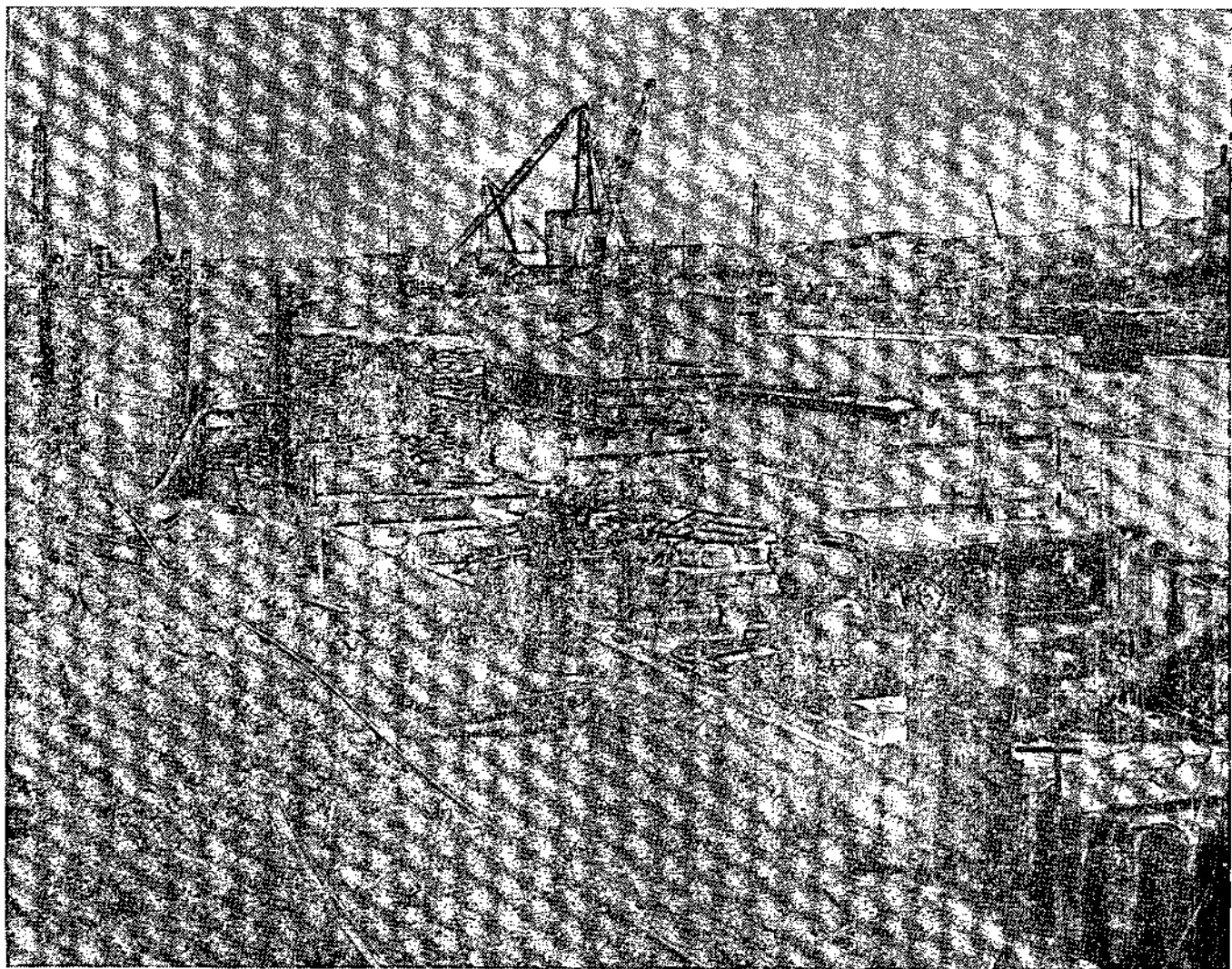
THE origin of the Calcutta Port goes back to nearly three centuries. Industrial development in India had its early beginnings around the three villages of Kalikata, Satahati and Govindpur during the days of Job Charnock. The metropolitan district of Calcutta as also the hinterland of the port started gradually to develop into the largest industrial and trade complex of the country. Appropriately, therefore, Calcutta grew to be the premier port of the country and the eastern gateway to India's maritime trade. Though it has lost this coveted status somewhat, it continues to occupy a strategic position in the economy of this country.

The Port of Calcutta is basically a riverine Port situated 126 nautical miles from the sea unlike other major Indian Ports. The Calcutta Port Commissioners, as Conservators of the river, are responsible for the maintenance of the River Hooghly—Bhagirathi, from a place south of the outfall of the Feeder Canal from the Farakka Barrage upto the sandheads at the mouth of the sea.

As conservators, the Commissioners have to maintain a very large, specialised Marine Service which includes River Survey, Dredger & Despatch Service, Maintenance of adequate navigational lighting in the river, Lighthouse, Light Ships, Buoys, Moorings, Hi-Fix Stations, Wireless Communication etc. All these services are of highly specialised nature and none of the Indian Ports has to tackle a problem of this

Shri Mitra is Chairman, Calcutta Port Commissioners.





Construction work in progress at Haldia—mid 1974

magnitude, Calcutta has peculiar problems to contend with.

Calcutta's distinguished record as the premier Port of the country till recent years was achieved through a continuous struggle against forces of nature. A dying river had to be kept alive as the main stream of the Ganga changed its course to join the Padma - Brahmaputra complex. This change in the course of the river confronted the Port of Calcutta with the serious problem of maintaining the river as a channel of navigation. The need of continuous dredging in the lower reaches of the river has been felt even more in recent years than ever before. The extent of siltation in the river since 1936 has been staggering. While in 1938-39 the maximum draft of the river was 30 ft. and remained above 26 ft. for 273 days in a year, the position in 1972-73 was that the maximum draft in the river fell to 27 ft. and remained above 26 ft. only during 42 days in a year! This is Calcutta's more serious problem and its solution, as we shall see, is not going to be an easy one.

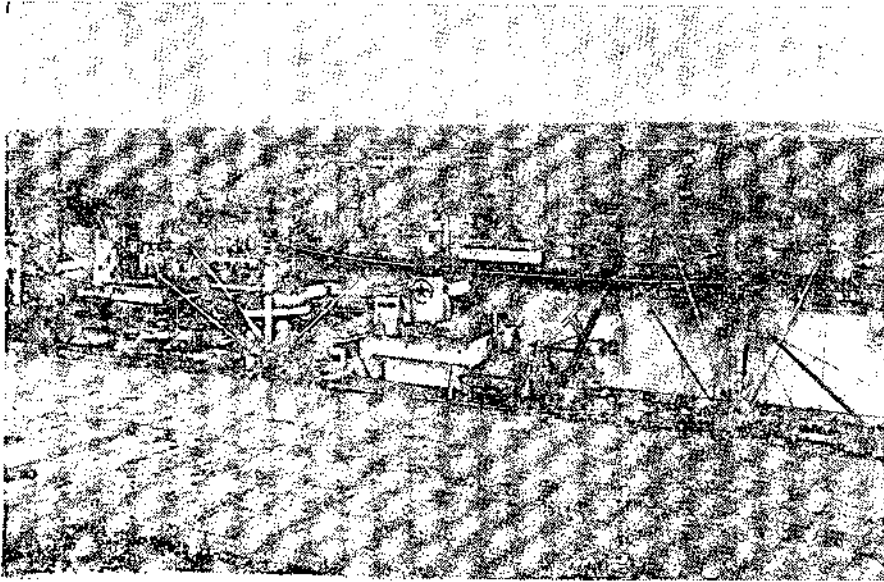
The problem of inadequate head-water supply through the Bhagirathi-Hooghly System due to the change of the main course of the Ganga was identified nearly a century ago, when for the first time, the idea of constructing a barrage for diverting water from the Ganga into the Bhagirathi-Hooghly System, was first conceived.

The growth of maritime traffic in India since Independence has been mainly in respect of bulk cargo. Simultaneously, modern trend in international shipping is towards the use of larger and deeper draft ships. The problem of inadequate depth in the River Hooghly has been the principal cause of decline of traffic handled by the Calcutta Port in recent years, as draft restrictions prevented modern bulk carriers tankers from visiting this port. India's sea-borne trade has risen four fold from 16.4 million tonnes in 1947-48 to 64.4 million tonnes in 1973-74. This phenomenal growth in traffic has been mainly in regard to bulk cargo like P.O.L., ore, foodgrain, fertilizer etc. Calcutta, due to its many in-built limitations,

has not been able to handle its legitimate share of the increased traffic of the country.

The Port authorities have all along been alive to the deteriorating situation in the River Hooghly. It was at their initiative that the Government of India took the decision in the early sixties to build a barrage at Farakka to divert waters from the River Ganga and also to construct a deep-water Dock System, 65 miles downstream at Haldia in addition to the existing two-Docks Systems at Calcutta more or less in the same manner as the Port of London Authority went down to the Tilbury Docks.

The primary objective of the Farakka Barrage is to save the Port of Calcutta, while the Dock System at Haldia is to assist in handling deeper and larger draft ships. Haldia was selected as a suitable site for construction of a deep-water dock after intensive studies were carried out by the United Nations Organisation, as also the World Bank. A Master Plan for the Dock was drawn up by a Special Committee which



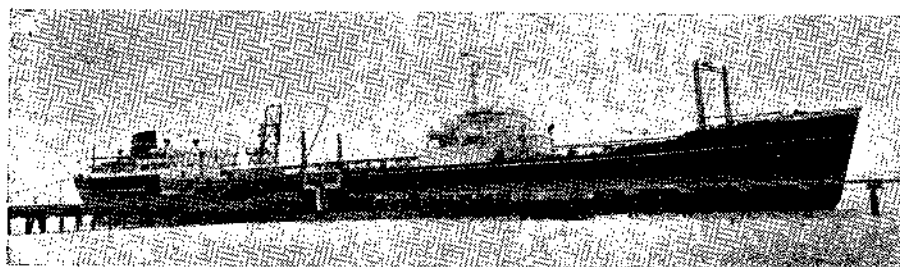
Kidderpore Docks, Calcutta



Dredging at the Calcutta Port

included the famous Harbour Management expert Mr Posthumo. The first phase of the Dock System envisaged construction of an Oil Jetty on the river, capable of handling large oil tankers, an Iron Ore Berth, a Coal Berth, a Fertiliser Berth, a Finger Jetty and two General Cargo Berths, of which one has facilities for handling containers. In Haldia, the country will have its first container terminal equipped with "Transtainer" and "Portainer" cranes. Further development of Haldia would depend upon the nature of growth of the country's trade, keeping the overall need of the country in view. The Project at Haldia has been designed to be an impounded Dock System on the same line as those at Calcutta in view of the tidal conditions of the river. The Oil Jetty built on the main river was constructed and commissioned in August 1968 and since then, it has been awaiting full commissioning of the Refinery being built by the Indian Oil Corporation.

Clearance for the construction of the Dock System at Haldia was given under special circumstances when the Government of India decided to go ahead with its construction purely with indigenous talent and resources. In building the Dock System, we have been confronted with new concepts in design and civil construction works. The Lock Entrance of the Dock, which is designed to be one of the largest of its kind in the world, would be 1010 ft. in length and 130 ft. in width with 3 sliding type caisson gates. In designing and manufacturing the various equipment required for the Lock Entrance as also for the high capacity loading and unloading devices to be installed at the various berths in the Docks, new designs, know-how and technology had to be developed in the country for the first time. Various manufacturing concerns which undertook to supply the machinery were faced with problems of tremendous magnitude and at Haldia it provided an experimental ground for many of the industries to develop their expertise to meet the future needs of the country. Understandably, therefore, there has been delay in completion of the work resulting in escalation in costs, chiefly due to spiralling inflation, but if looked at from the national point of view, it will be seen that what has been a loss to the Port due to delay has been a gain to the country in the form of new know-how and technology. Haldia has yielded us a rich harvest of experience in port construction.



The idea of a subsidiary port to Calcutta is nothing new. It was conceived over 100 years ago. It took about a hundred years for the British to make up their mind about locating a subsidiary port for Calcutta. The only site which came up for consideration after Independence was Geonkhali. Before that, at one time the Diamond Harbour had been thought of but it was not found suitable for many reasons because the Balari bar was further down south. Then another site at Luff Point was selected for survey but it was also given up on technical considerations. Geonkhali was also examined and rejected. There are many factors which have to be looked into in the location of a site for a port of which climate, susceptibility to storms and cyclones are very important. Saugor Island was never considered because what is believed to be its deep draft happens to be only a pool. One has to go 40 miles south to reach the sandheads. In any case you have to dredge upto 40 to 70 feet draft if you want to take advantage of this but this is not worth the expense. Hence Haldia was finally selected for development as a deep draft port.

The Haldia project from the beginning to the finish completely Indian in conception, planning, and designing including the lock gate has given India rich experience and we can well be proud of what has been achieved. With the commissioning of the Haldia Dock Project, the Calcutta-Haldia Complex would be able to effectively participate in the country's expanding trade. By 1979 the Calcutta-Haldia Complex alone will be able to handle over 20 million tonnes of traffic.

Although the commissioning of the Feeder Canal at Farakka for discharge of adequate headwater from the Ganga to the Bhagirathi-Hooghly System has been delayed, the work of the Canal is expected to be completed shortly and the Farakka waters would start flowing down the river soon.

This would usher in a new era in the annals of Calcutta Port. It is expected that the river would be-

come navigable upto places in Bihar and U.P. thereby opening up new possibilities in inland navigation. At the same time, the navigability of the river in the lower reaches would also improve and the necessity and intensity of maintenance dredging of the present magnitude would diminish substantially. Furthermore, the schemes for water supply to the metropolitan city of Calcutta as also to the new industrial complex coming up at Haldia would to a large extent, become feasible on account of adequate water supply from Farakka.

While Farakka is expected to arrest further deterioration in the river, in order to effectively handle large modern bulk carriers at Haldia, the Port authorities have embarked on a project for deepening the inner estuary channel leading to the Haldia Dock. The work has been entrusted to foreign firms on contract basis and it is hoped that by the beginning of 1976, a draft of 35 ft would be available for 265 days in a year and thereafter at the rate of one more foot every year and a final draft of 40 ft by 1980. Over and above this, the Commissioners have also undertaken a large number of River Training Works in the Hooghly-Bhagirathi System. They have so far spent about Rs 57 lakh in these training works and provision has been made in the Fifth Plan for spending another Rs 1500 lakh.

With the commissioning of the Haldia Dock System, the Farakka Feeder Canal and the River Training Works one could envisage the tremendous development that would take place in the Calcutta-Haldia region in the coming years. Rapid industrialisation of the areas generating employment opportunities for thousands of men, development of inland water transport system between Haldia and Calcutta, and Bihar and U.P. would greatly stimulate industrial activities in the region and would open up enormous possibilities for the entire eastern sector. In spite of the present difficulties the port of Calcutta is bound to prosper and play a strategic role in our economy in future. □

PRESSURE ON PORTS, CAUSE OF HEAVY DEMURRAGE

Large sums of money are spent by the Department of Agriculture when the total time taken in the berthing and unloading of some of the fertiliser vessels at Indian ports is more than the stipulated period according to the charter terms.

The payment of demurrage was not done by the Food Corporation of India, who were only handling agents for non-potassic fertiliser vessels after they had been berthed at the Indian ports. Although demurrage in some cases was heavy, the overall amount paid when compared to the total value of the cargo imported was not very heavy.

In 1973-74, the country imported fertilisers worth Rs 177 crore which were handled at the Indian ports and the net demurrage paid was Rs 90 lakhs that is, about 0.5 per cent of the value of the fertiliser handled.

The delays to fertiliser vessels had been mainly due to heavy preberthing detentions which took place even before the Food Corporation of India came into the picture. The detentions were mainly due to the great pressure on the limited number of berths at the ports on account largely of food-grain imports.

Arrangements were being made to mechanise unloading of bulk fertiliser at major ports under a phased programme and the first high speed mechanised arrangement was under execution at Kandla port.

During 1972-73, the demurrage incurred in respect of fertiliser ships at Indian ports was about Rs 16.58 lakhs and the despatch money earned was about Rs 47.34 lakhs, thus giving a net earning of Rs 30.76 lakhs.

During 1973-74, the demurrage incurred was about Rs 134.93 lakhs and the despatch money earned was about Rs. 44.86 lakhs, thus placing the net demurrage incurred at Rs 90.07 lakhs.

Though some of the foreign shipping lines were reluctant sometimes to carry fertilisers to India because of delays at Indian ports, by and large, the fertiliser shipment programme from various regions of the world had not been adversely affected. In spite of many ship-owners' demand for higher rate of freight and demurrage, it had been possible to secure ships for carrying fertilisers at competitive market rates.

FAST GRAIN DISCHARGERS FOR THE PORTS

The time gap between foodgrains carrying ships docking in ports and discharging their cargo will be reduced with the installation of more modern grain dischargers at Bombay and Calcutta ports. The Food Corporation of India has recently placed an order for eighteen units of Buhler pneumatic discharging equipment. Four of these will be installed at Calcutta port and the rest at Bombay port. Each of these units has a capacity to discharge foodgrains from the holds of the ships berthed in the docks at the rate of 60 tonnes per hour. These are mobile units with diesel engine and suction blower. They incorporate arrangement to siphon off and bag dust separately.

Although it is one of India's ancient ports, the modern Port of Cochin came to be developed only during 1920-40. It was declared a Major port in 1964. Well connected with the hinterland by a network of roads, railway, inland waterways and airlines, Cochin has come to play a vital role in the economy of South India. At the end of the fifth plan the port's traffic is expected to reach 6.5 million tonnes

COCHIN—

Natural Harbour with Rich Hinterland



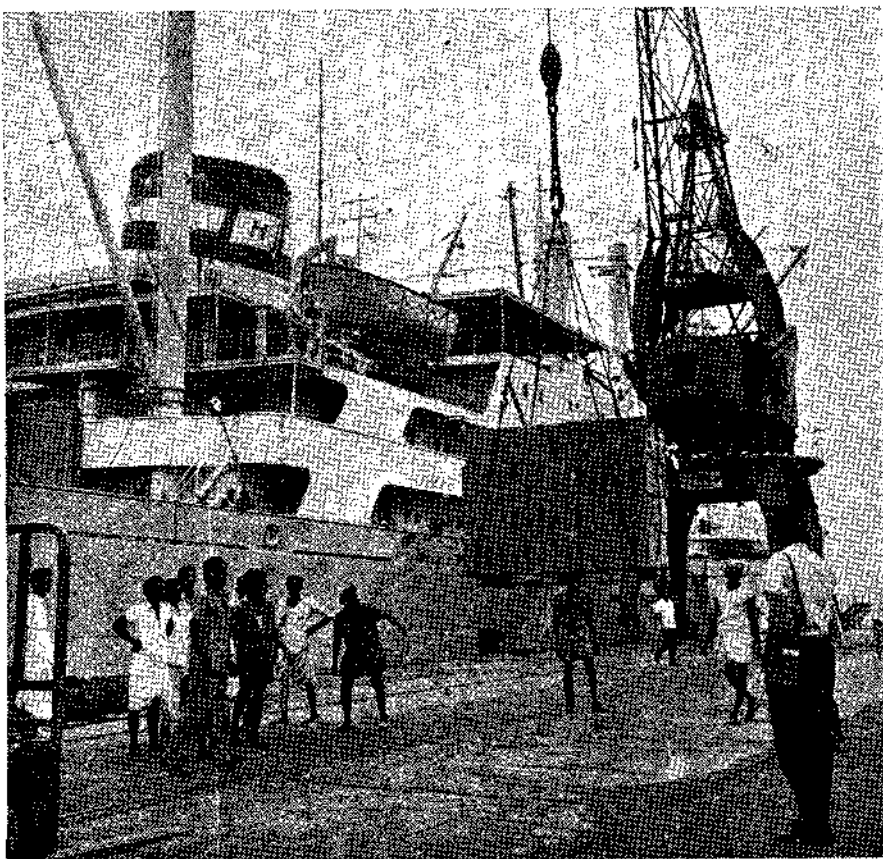
THE origin of the Port of Cochin must be traced to a major geographical development in 1341 AD when there was a change in the mouth of the Periyar for long a "river of sorrow" in Kerala known for its devastating floods. About this time it is said to have forced a way into the sea opposite the present town of Ernakulam and thereby made possible the emergence of Cochin Harbour.

The shipping trade of the Port

was situated at the coastal area now known as Fort Cochin with the Port serving as a roadstead. Cochin came under Portuguese occupation from 1500 A.D. In 1663 AD Cochin passed from the Portuguese to the Dutch and in 1795 AD the British took it over from the Dutch. The relics of this period of occupation are to be seen in the Churches and buildings that still exist at Fort Cochin. Until the end of the 18th century Cochin was "a very important port with its harbour filled with ships, streets crowded with merchants and warehouses stored with goods from every part of Asia and Europe indicating the industry, the commerce and the wealth of the people".

Modern Facilities

The modern Port of Cochin was developed during the period 1920-1940. Sir Robert Bristow who was the Harbour Engineer-in-Chief and later became the Port's first Administrative Officer, was responsible for this daring engineering feat of cutting across the rock-like barrier to open up the present port located on Willingdon Island (reclaimed from the lake with dredged spoils) with the open sea by cutting an approach channel 450 ft. wide and $3\frac{1}{2}$ miles long. By 1930-31, the port was formally thrown open for vessels upto 30 ft. draft. With the completion of the bridges connecting the Port with the mainland, the Mattancherry wharf with electric cranes, warehouses, transit sheds, offices, roads, electricity, port railway, water supply and ancillary works, Cochin was declared a major port in August 1936 with just two wharf



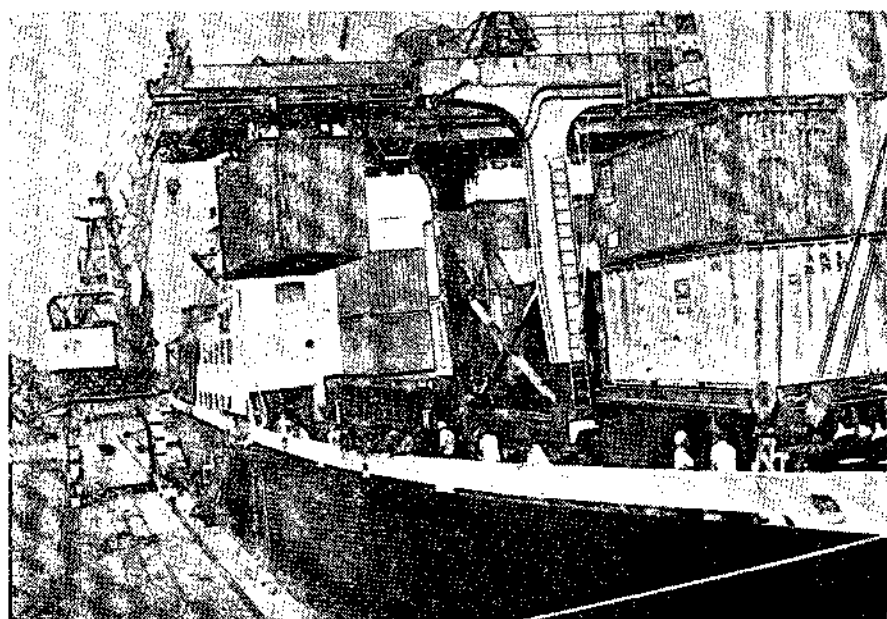
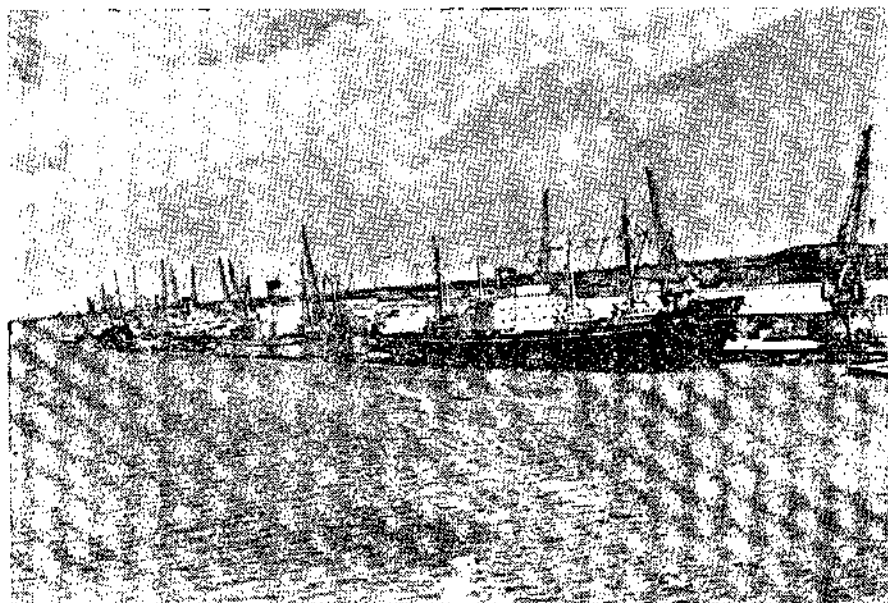
berths in Mattancherry. By 1951, the Port had four wharf berths capable of accommodating four vessels of 450 ft. in length in addition to the Boat Train Pier for passenger ships, and thirteen stream moorings in the Mattancherry channel on the Western side and three stream moorings in the Ernakulam channel on the eastern side. The stream moorings in the Ernakulam channel were mainly intended for use of coastal vessels and oil tankers and the rest was for general cargo steamers.

The additions of the South Coal Berth in August 1953, the North Tanker Jetty in December 1955, the South Tanker Jetty in February 1956 and the North Coal Berth in November 1959 followed in quick succession during the First and Second Five Year Plans. During the Third Plan, the Ernakulam wharf with four additional general cargo berths was commissioned fully equipped with cranes, railway lines, transit sheds, warehouses and cargo handling equipment. The modified North Tanker Jetty was commissioned to cope with the heavy import of crude oil for the Cochin Refineries in July 1966.

Considering the rapid growth of traffic and the need to stabilise the Port's management to deal with the day-to-day problems effectively, paying also due regard to the interests of the users of the Port and the governmental agencies concerned, the Port was constituted into a Port Trust under the Major Port Trusts Act 1963 from 29th February 1964.

Willington Island is the seat of the Administrative Office of the Port and houses a large number of busi-

A view of the Ernakulam wharf at Cochin Port



A loaded container being shipped at Cochin Port

ness firms engaged in the import-export trade of the Port. The Port is connected with its vast hinterland by a network of roads, railway, inland waterways and airlines enabling quick transport of cargo to and from the various centres of origin and destination of cargo handled at the Port. Its hinterland includes the whole of Kerala, large areas of Tamil Nadu and some parts of Karnataka and hence the port plays a vital role in the economy of this area. With its strategic location on the South West Coast of India and a commanding position on the crossroads of the East West Ocean trade, the Port is at present the natural gateway to the vast potential industrial complex and the growing produce markets of South West India. The foreign export trade of

the Port contributes 11 per cent of the total foreign export trade of the country and links up Cochin with every part of the world with its variegated trade relations.

The growth of the Port's traffic since 1950-51 may be seen from Table I.

The Port handled 54.24 lakh tonnes of traffic in 1967-68 at the height of the national emergency following unprecedented drought and failure of agriculture when a sizeable quantum of foodgrains and fertilizers was imported to meet the crisis. However, there has been a substantial fall in the imports of these bulk cargo with the improved agricultural scene since 1968-69.

A sizeable decrease in import of POL and export of POL products has adversely affected the port's trade in recent years. Cochin Refineries Ltd. which was started with an initial refining capacity of 2.5 million tonnes of crude in 1966 has already increased its refining capacity to 3.5 million tonnes of crude from early 1974. However, during 1973-74, there were frequent shutdowns at the Refinery leading to a lower throughput. Apart from this, the import restrictions imposed by the Govt. in view of the rise in crude prices have reduced the quantum of imported crude. After the recent oil price hike by the OPEC there is great difficulty in getting adequate supplies of crude. However, there are indications that the Refinery may be able to raise its refining capacity to 3.5 million tonnes.

It was expected that the supplies of crude could be imported by the Refinery in Super Tankers of 85,000

TABLE I

	(In lakh tonnes)						
Year	Import		Export		Total		Grand Total
	Coastal	Foreign	Coastal	Foreign	Coastal	Foreign	
1950-51	3.11	8.05	1.11	1.42	4.22	9.47	13.69
1955-56	7.69	4.71	1.52	2.42	9.21	7.13	16.34
1960-61	9.13	7.08	1.49	2.38	10.62	9.46	20.08
1965-66	10.50	13.63	1.95	2.64	12.45	16.27	28.72
1970-71	1.55	32.92	9.44	4.51	10.96	37.43	48.39
1973-74	2.72	26.04	4.18	4.27	6.90	30.31	37.21

TABLE II

(Rs in crores)								
Year	Coastal		Foreign		Total		Grand Total	Balance of Trade
	Export	Import	Export	Import	Export	Import		
1950-51	16.40	17.31	39.79	13.78	56.19	31.09	87.28	26.01
1955-56	22.80	26.33	51.16	25.76	73.96	52.09	126.05	25.80
1960-61	33.05	26.74	58.55	35.64	91.60	62.38	153.98	22.91
1965-66	46.41	29.54	84.44	66.11	130.85	95.65	226.50	18.33
1970-71	49.34	9.72	163.86	107.68	213.20	117.40	330.60	56.18
1972-73	47.16	11.79	203.20	99.65	250.36	111.44	361.80	103.55
1973-74	39.68	5.67	273.00	142.19	312.68	147.86	460.54	130.81

TABLE III

Year	No. of ships entered	NRT (In lakhs)	No. of sailing vessels entered	NRT (In lakhs)
1950-51	871	23.33	287	0.22
1955-56	939	28.72	283	0.23
1960-61	1337	42.84	144	0.15
1965-66	1178	43.21	98	0.11
1970-71	1026	45.25	39	0.05
1971-72	1036	45.37	47	0.06
1972-73	1006	45.44	24	0.03
1973-74	853	36.22	42	0.06

DWT by 1973-74 to take advantage of the freight economies and that Cochin Port would provide the Super Tanker Berth by 1973-74 to berth these super tankers. But in view of the decision to change the location of the Super Tanker Berth to Bolghatty channel, this proposal has not materialised. With the existing draft of 30 ft., the Refinery is now obtaining supplies in smaller tankers of 20,000 DWT despite the uneconomic freight involved. The early commissioning of the Super Tanker Berth in Bolghatty channel will facilitate berthing of 85,000 DWT tankers initially with 40 ft. draft and 1,15,000 DWT tankers with further deepening of the channels thereafter. Apart from other advantages, this is expected to bring in a substantial freight advantage—almost entirely in foreign exchange—estimated at about Rs 8.5 per tonne or in other words over Rs 2.5 crore in one year over 3.5 million tonnes of crude that Cochin Refineries Limited would be importing.

The port handles a large variety of traditional as well as non-traditional traffic. The major commodities

that are exported from the Port are refined petroleum products, tea, cashew kernels, rubber, coir products, spices, timber, marine products, coffee, etc. Major items of imports include crude oil, foodgrains, fertilisers raw and finished, cashew-nut, cotton (raw and waste), machinery and hardware, salt, zinc concentrates, bauxite, coal, etc. However, the pattern of trade has undergone a perceptible change in the past decade. With the commissioning of the Cochin Refineries in 1966, there has been a sudden spurt in the import of crude and export of POL products. Today almost 70 per cent of the cargo handled at Cochin are crude oil and POL products. The upward trend in exports of marine products is encouraging while the unsteady trends in most of the traditional cargo give room for concern. There is pressing need for trade promotion at the port with the growing competition among the ports on the West Coast and the likely diversion of traffic to the newly developed ports. The port management is quite aware of this matter and all attempts are being made to improve operational efficiency and port facilities.

Value of Trade

The pattern of traffic at the Port in terms of value of trade can be seen from Table II. During the last 23 years, there has been more than six fold increase in the export trade handled at Cochin Port. Cashew Kernels, tea, marine products, coffee pepper and coir products are among India's important foreign exchange earners. The balance of trade at the Port has also been increasing steadily during the last few years.

Most of the general cargo exported through the port are sensitive to international competition. Consequent on the closure of the Suez Canal in 1966, and the diversion of liner ships via Cape of Good Hope, freight rates have gone up steeply and shipping opportunities are fewer than before. There is also an acute shortage of shipping space and several lines are over looking this port for want of adequate inducement after they have been more or less fully loaded at the earlier ports of Bangladesh, Calcutta, Vishakhapatnam, Madras, and Colombo. Many of our export cargo are therefore not able to compete effectively in the foreign markets in view of freight disparities and consequent high landed cost of these products in these markets. The competing products from African, South American and Pacific countries have therefore an edge over us in the matter of such exports. If the Suez Canal is opened soon, there is every chance of these disadvantages being overcome so that our exports can again become competitive.

• Consistent with the traffic handled, there has also been a steady increase in the shipping activity at the Port as may be seen from Table III. In view of the declining traffic trends, there has been a steady decline in the number of ships calling at the Port. While they numbered 1006 ships and 23 sailing vessels during 1972-73 only 853 ships and 42 sailing vessels called at the port during 1973-74. Tankers, colliers, foodgrain carriers, fertiliser carriers and general cargo ships constitute the shipping at the Port.

During the successive Five Year Plans the following levels of investments were made in the Port.

Plan	Actual investment (Rs. in crores)
First Plan (1951-56)	0.59
Second Plan (1956-61)	3.00
Third Plan (1961-66)	1.88
Three Annual Plans (1966-67 to 1968-69)	3.29
Fourth Plan (1969-74)	7.43 (Provisional)

The total investment in the assets of the Port at cost is estimated to be Rs 21.00 crore at the end of the Fourth Plan.

The important achievements during the Fourth Plan include the commissioning of the open berth Q-9 in December 1969, the acquisition of additional floating craft such as high power tug, wooden tugs, pilot launch, additional fork lift trucks, mobile cranes and wharf cranes with grabs.

The extension of the open berth to 808 ft. from the existing 555 ft. 6 ins. is in an advanced stage of completion. The construction of the two dredgers ordered on Messrs Garden Reach Workshops is also in advanced stage of progress and they are expected to be commissioned any time now. The second high power tug under construction at the Hooghly Docks and Engineering Company is also nearing completion.

The construction of the two jetties and the storage-cum-conveyor complex for handling the bulk import of rock phosphates for the Phase II expansion of Cochin Fertilisers and the conversion of the South Coal Berth for handling the import of liquid ammonia in bulk have been taken up and the work is in progress. The construction of a modern fisheries harbour at an estimated cost of Rs 2.72 crore in the Mattancherry-Marakadavu area on the Mattancherry foreshore for handling of deep sea trawlers and mechanised fishing trawlers upto 120 ft. in length is in progress. When completed in 1976, this facility will be of immense benefit to the fishing industry in this area which is already a promising foreign exchange earner, employing a large number of people.

During the Fifth Plan, it is proposed to step up the Port capacity from 62.50 lakh tonnes per year (at the end of the Fourth Plan) to about 115.00 lakh tonnes. It is anticipated that the Port's traffic will rise to 65.41 lakh tonnes of which 40.76 lakh would be crude POL and refined products, 6.92 lakh tonnes will be fertilizers (raw materials and finished products), 1.15 lakh tonnes will be foodgrains, 0.50 lakh tonnes of salt, 1.65 lakh tonnes of steel and machinery, 1.00 lakh tonnes of coal and 13.43 lakh tonnes of other dry cargo.

The Govt. have provisionally approved an outlay of Rs 44.75 crore during the Fifth Plan for port development including Rs 32.30 crore for spill-over schemes and Rs 12.45 crore for new schemes. The important spill-over schemes are the construction of the Super Tanker Berth in the Bolghatty

channel, a container berth at Q-9 and the purchase of a dredger to replace the existing bucket dredger and an additional pilot launch. The new schemes include the construction of the deep draft fertiliser berth for mechanised handling of bulk rock phosphates for the F.A.C.T., housing for Port staff, remodelling of South Coal Berth to handle bulk liquid ammonia, reefer cargo and other commodities, a new medium dry dock, preparation of a Master Plan for port development and the setting up of a Staff Training Institute to provide training facilities for the port staff.

The Port has on its roll over 6,500 employees including officers, staff and labour and is among the largest employers in this part of the country. Frequent strikes and other go-slow agitations cause dislocation to the Port's working. During 1973-74, there were 15 strikes involving a loss of 49,909 mandays.

Trade Union rivalry is among the major causes for industrial unrest as these unions are controlled by different political parties. Industrial disputes are resolved by mutual discussions and settlement. Efforts are now afoot to bring about a stable and peaceful atmosphere by bipartite agreement. The present indications are that 1974-75 is likely to prove a peaceful year of productive endeavour for the Port. Welfare amenities in the shape of staff recreation clubs, canteens, co-operative stores, credit society, etc. are provided to the employees of the Port on Willingdon Island. A well equipped 62-bed hospital with all modern amenities and specialist medical officers is provided for the treatment of port employees and their families. Scholarships are awarded to deserving children of port employees undergoing technical, professional and general education.

For improving the productivity of operating workers, a number of incentive schemes have been introduced at the Port for different categories of workers. Voluntary retirement benefits are also available for the shore labour.

New Challenges

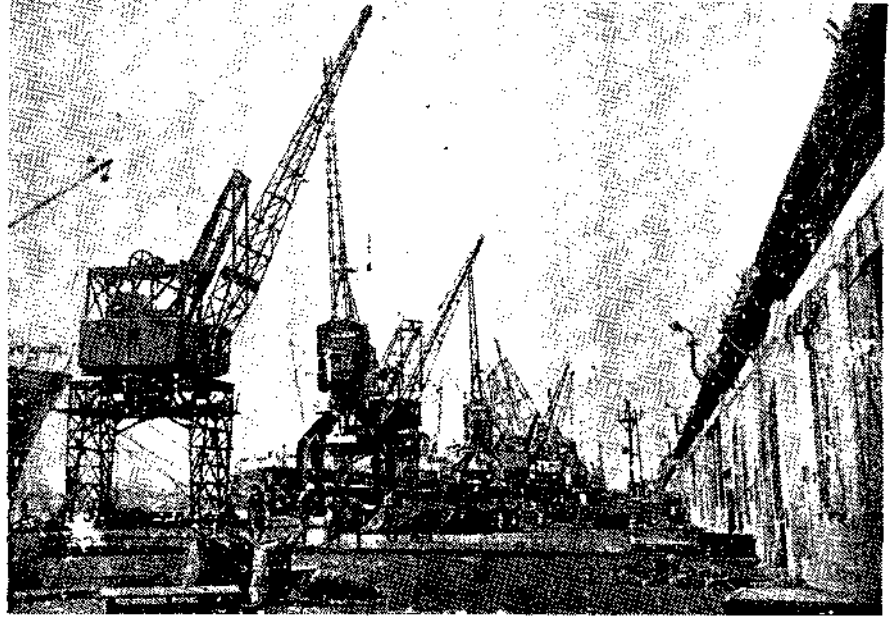
The Port has made rapid progress in cargo handling and port operations. Palletisation, pre-slinging and containerisation of cargo are coming into vogue in the export of tea, cashew kernels, marine products, pepper, spices, etc. Considering the large volume of containerisable export cargo at this port, plans for construction of a container berth at Q-9 during the Fifth Plan have been drawn up. Temporary facilities have

been provided for handling containers at the Q-5 berth to facilitate the operation of a feeder container service via, Cochin and Bombay to U.S. ports by the American President lines who have scheduled to operate this service twice a month. Cochin was the first port in India to receive a fully containerised ship on November 27, 1973.

The important exports hitherto handled have been rubber, rubber products, marine products, cashew kernels, tea, spices, cotton piece goods, pepper, coir mats and other general cargo of value while the potential imports include drugs, chemicals, iron and steel, machinery, hardware, cashewnuts, cotton, etc. The cargo are packed in standard containers of size 8 ft. x 8 ft. x 20 ft. The traffic is now mostly in exports and the results are being watched. There are decided advantages in this cargo handling technique like reduced damages and pilferage, lower insurance and packing costs, lower freight per tonne and greater speed in transportation to facilitate greater turnover for the shippers. However, the economies of this traffic will be maximised only when there is a balanced traffic of exports as well as imports.

Wherever necessary, the cargo handling operations on shore and on board are being modernised with mechanical aids such as fork lift trucks, tractor-trailers, mobile cranes and the versatile 120 ton floating crane. A decision has been taken to provide modern maintenance facilities to improve the performance of floating craft and cargo handling equipment for ensuring trouble free port operations.

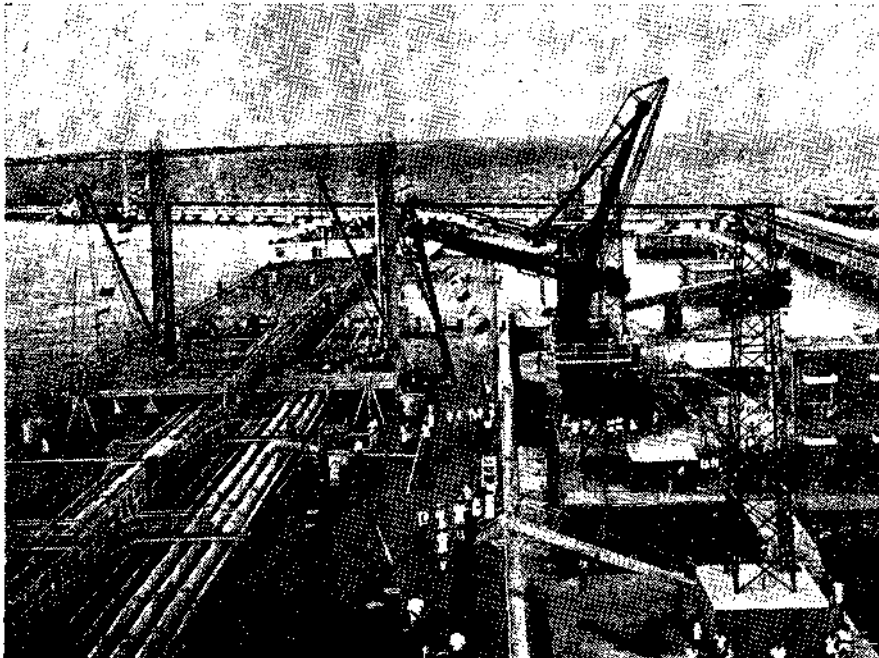
Facilities at the port still need to be streamlined for higher levels of throughput and quicker turnaround of ships. The effective implementation of the schemes for port development is the most challenging problem of the port. This would call for all round awareness of the changing needs of the port's traffic like the increased capabilities of modern ships and the need for deeper drafts, better maintenance of port craft and cargo handling equipment and above all, the requisite imagination and courage to co-ordinate the problems of port operations for optimum levels of efficiency. At the same time, the port has to make a determined effort to sustain existing traffic, develop new traffic and provide adequate facilities for the promotion of trade through the Port. The creation of a free trade zone at Cochin would substantially help to increase the flow of trade at the Port. □



THE MADRAS PORT

R. BALASUBRAMANIAN

A purely artificial harbour with a history of barely a hundred years, it is today a major outlet and inlet for export-import trade on India's eastern seaboard. The main problem faced by the port is improvement in the rate of loading and unloading of general cargo. Pre-slinging, palletisation and turn-round of ships are the methods now being attempted to improve the efficiency of the port.



View of oil berth with marine loading.

PRIOR to 1875, there was nothing at Madras in the nature of a harbour either natural or artificial. There was simply an open roadstead on an exposed sandy coast swept by storms and occasional monsoons of extreme violence. An iron screw pile pier constructed during 1859-61 with its head at a depth of 9.14 m served as a means for loading and unloading operations during calm sessions. The cargo handled in those times was of the order of 3 lakh tonnes per annum.

During 1876, the work on the construction of two breakwaters 914.4 m long running west to east to provide an enclosed basin was started. The enclosure for the Basin with an eastern entrance of 167.64 m wide were completed in 1881. But during the cyclone that lashed Madras in the same year, the breakwaters were severely damaged necessitating investigation into the location of the entrance and section of the breakwaters.

Based on the recommendations of a Committee constituted for the purpose, work was started for the remodelling of the Harbour in 1905. Four berths on the western side with transit shed behind them and Boat Basin and timber pond were also formed. Three double storeyed warehouses were also constructed. In 1931 a coal berth was constructed as a Jetty and in 1936 another berth South Quay-I was commissioned. With all these, the Port was handling only about 1.1 million tons of cargo. There were only 4 transit sheds and 3 double storeyed warehouses to cater to the cargo transportation and storage.

Shri Balasubramanian is Chairman Madras Port Trust.

MADRAS AND CYCLONES

A peculiar phenomenon called "range effect" occurs in the Madras Harbour, which means that under cyclonic conditions in the Bay of Bengal, the swells entering the geometrically shaped harbour, start a harmonic motion in three dimensions of the waters inside the harbour. Under conditions of such ranging, ships start pitching, rolling and surging. It has been found necessary on such occasions to take the ships out to the open sea to prevent damage to the dock structures and to the ships themselves.

The designs for enlarging the water-spread of the enclosed harbour and the provision of additional berths had, therefore, to take into account the effects of the "littoral drift" and the "range".

Madras is not seriously affected by the south-west monsoon and does

not, therefore, have to cope with long, rainy, periods which affect the Cochin and Bombay ports on the West Coast. The cyclonic storms during the north-east monsoons, however, cause heavy showers from October to December. During November and occasionally in May, October and December, the Bay of Bengal is affected by cyclonic storms, at times intense. Their passage is normally well known in advance and ships have no difficulty in avoiding them. Ships caught by them, while at Madras, either ride them out in the enclosed harbour or get out of the port to the open sea and away from the storm. Shipping operations are, therefore, liable to interruption during these periods of cyclonic storms. In the past thirty years, the duration of such interruptions has not exceeded a total of six days a year in two or three spells. In some years no interruption to shipping has occurred while in some other years the interruptions have been as low as a day or two days.

One berth at South Quay is earmarked for handling coal. At this berth mechanical devices like cranes fitted with grabs to grab coal from inside the holds of the ships and unload the same are provided. Iron ore is at present loaded semi-mechanically at one berth and manually at three other berths. A fully mechanised berth for loading at the rate of about 8,000 tonnes an hour to meet the targeted shipment of 5 million tonnes a year is under erection.

South Quay-I is being improved with hopper facilities for quicker turn round of ships and faster clearance of fertiliser in standardised bags after weighing.

Among the principal items imported through the Madras port are crude oil, foodgrains, fertiliser, coal, iron and steel, paper, machinery, phosphoric acid etc. The principal items of export are iron ore, berytes, hides and skins, tobacco, refined petroleum products and sugar. □

In 1946, a Committee was constituted to examine the question of providing a deep sea port on the east coast capable of accommodating large sized ships at all seasons. Based on its report, further development plans were drawn up. But these plans remained in cold storage till 1954 because of financial constraints.

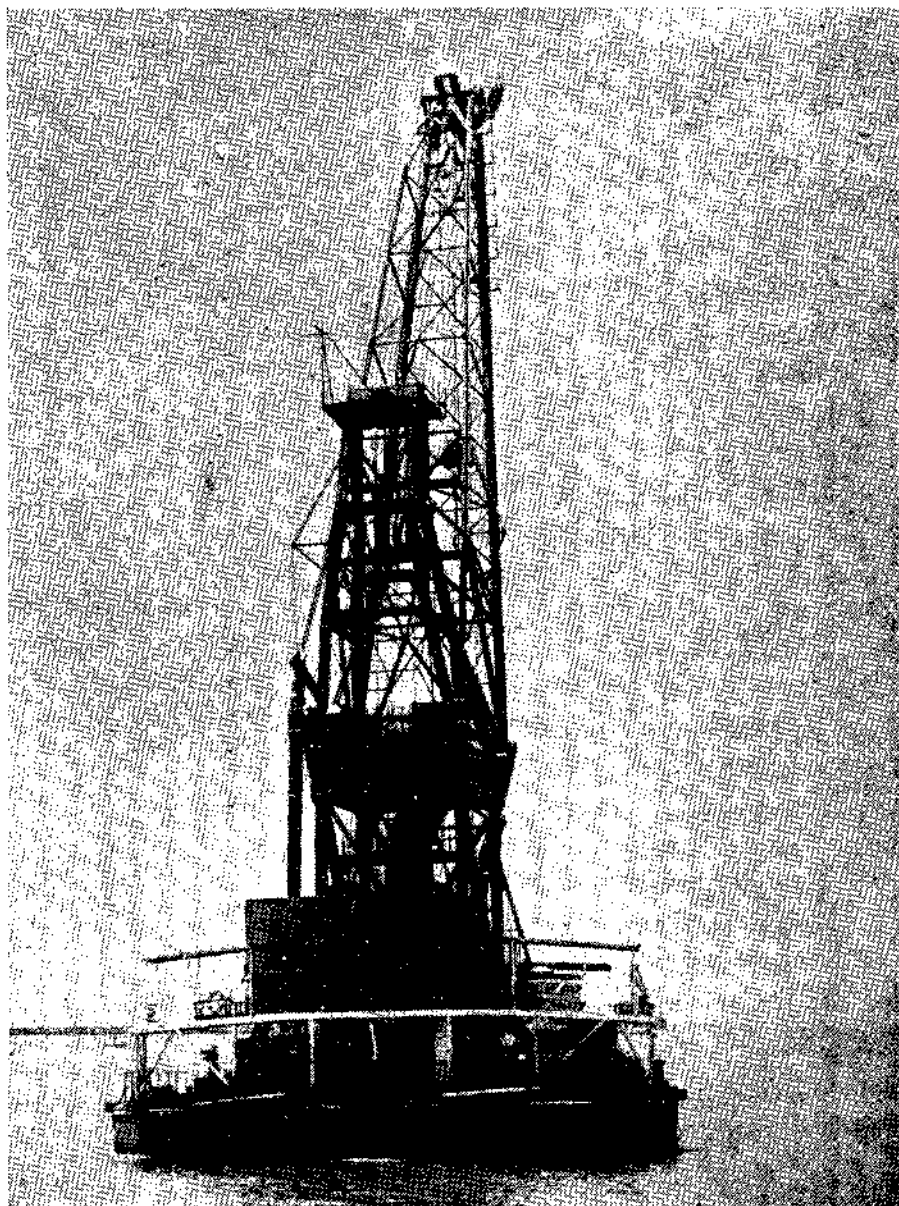
As on 1951, there were only 9 berths and a few moorings handling cargo of 2.15 million tons which caused great strain and congestion. There were only 19 cranes on the Quays.

Since Independence

With the launching of the First Five Year Plan in 1951, the following major works were undertaken:

- (1) A modern passenger station-cum-transit shed was commenced at the North Quay on the top of a new R.C.C. jetty as the then passenger station on the southern side of the South Quay-I had become outmoded and lacked modern facilities.
- (2) A new warehouse was constructed.
- (3) The existing workshop was improved with new machine tools and the addition of a 200-ton chain testing machine.
- (4) Preliminary investigation was taken up and plans and estimates were drawn up for the Jawahar Dock Project, South Quay berths, ore and coal berths.

The floating crane 'Vaisali'



The important work undertaken in the Second Plan were:

- (1) Construction of Jawahar Dock leading out south of the main harbour basin. This new dock envisaged a basin of 518 metres $\times$ 152 metres to accommodate 6 berths with ancillaries such as transit sheds, water and power supply, oil bunkering line etc. Three western berths were used for handling heavy food imports and the three eastern berths for handling iron ore.
- (2) The berthing capacity at the port was further augmented by reconstruction of the two old screw pile timber jetties South Quay I and II. The drafts at these jetties were improved to 9.8 m and 9.1 m, respectively. The new South Quay-I berth was equipped with a heavy lift 50-ton crane to facilitate handling of heavy cargo.
- (3) Three more berths were added viz. South Quay-III, IV and V with drafts of 9.1 metres, 9.1 metres and 7.9 metres respectively. The South Quay-III is reserved for handling iron ore, while the berths IV and V are for handling coal. With the addition of these three berths, the length of the Quays has increased from 1302 metres to 2987 metres.
- (4) The port acquired two dock tugs equipped with fire-fighting monitors, a new trailing suction hopper dredger of 1500-tonne hopper capacity and a 120-ton floating crane.
- (5) Better warehousing facilities were provided with increased warehousing and transit shed area.
- (6) A new signal station and a new building for Port Trust's administrative office were constructed.

While some of the development works envisaged during the Second Plan were completed, the others spilled over to the Third Plan period. The new works taken up during the Third Plan period were:

- (1) Deepening the 3 berths on the eastern side of the Jawahar Dock to 11.00 metres depth to cater for ore carriers of deep draft.
- (2) Reclamation of about 5.7 hectares of land from sea at Royapuram bay.
- (3) Modernisation of the workshop by shifting it to new site.
- (4) Construction of third transit shed at Jawahar Dock.
- (5) Laying of independent water mains of size 53 mm. dia. from

Kilpauk waterworks to harbour to augment fresh water supply.

- (6) Augmentation of the existing equipment by the addition of additional fork lift trucks and mobile cranes.

The major scheme of the Fourth Five Year Plan was the construction of an outer dock, named Bharathi Dock, north of the existing harbour at an estimated cost of Rs 2320 lakh. The Bharathi Dock initially comprising an oil berth and an ore berth are both designed for catering to 100,000 DWT vessels. The dock encloses a basin area of 80.94 hectares formed by the construction of two breakwaters on the northern and eastern sides. An area of 40.47 hectares will be reclaimed on the western side of the dock to house the ore berth now under construction and the future berths.

The oil berth now commissioned is the deepest so far in the country. The oil berth now catering to 77,000 DWT tankers is provided with pipelines and 5 marine loading arms, 3 for handling crude and 2 for refined products. The crude can be pumped at 4000 tonnes per hour and the refined products at 1000 tonnes per hour. Facility to deballast is also provided.

The ore berth at the Bharathi Dock now under construction is capable of accommodating combination carriers upto 100,000 DWT. The berth will be served by a fully mechanised ore handling system consisting of rotary wagon dumpers, conveyors, reclaimers and shiploaders. It will handle 5 million tonnes of iron ore per annum initially and 8 million tonnes ultimately. The rated loading capacity is 8000 tonnes per hour. The ore berth will accommodate 70,000 DWT ore carriers initially. It is expected to be commissioned by early 1975.

Equipment

The Port has 49 electrically operated wharf cranes with capacity ranging from 3 tons to 13 tons and one rail mounted, electrically operated 50-ton crane. Besides, 40 mobile cranes of capacity 1-1/2 tons, to 10-tons 2 Nos., 13-ton transporter cranes, 94 Nos. Fork lift trucks with a capacity upto 5 tons, 12 payloaders of capacity 3 to 6 tons, 12 tractors and 32 trailers are available for efficient cargo handling.

A floating crane 'Vaigai' of 120 tonnes capacity also helps the handling of heavy package overside. The vessel has accommodation to carry loads upto 250 tons.

Palletisation on an extensive scale is also among other factors helping to achieve quicker turn round of

vessels. Pre-slinging method in cargo handling has also been introduced.

The Port-owned railway system with a length of 64 km. covering almost all the Quays, transit sheds and warehouses serves all the shipping requirements. All the alongside berths have fresh water connections for supply to shipping. Ships at the moorings are supplied water by two water barges. Adequate facilities exist for bunkering oil.

Round the clock navigation is permitted in the port except in the Jawahar Dock where there is no night navigation after 10 P.M.

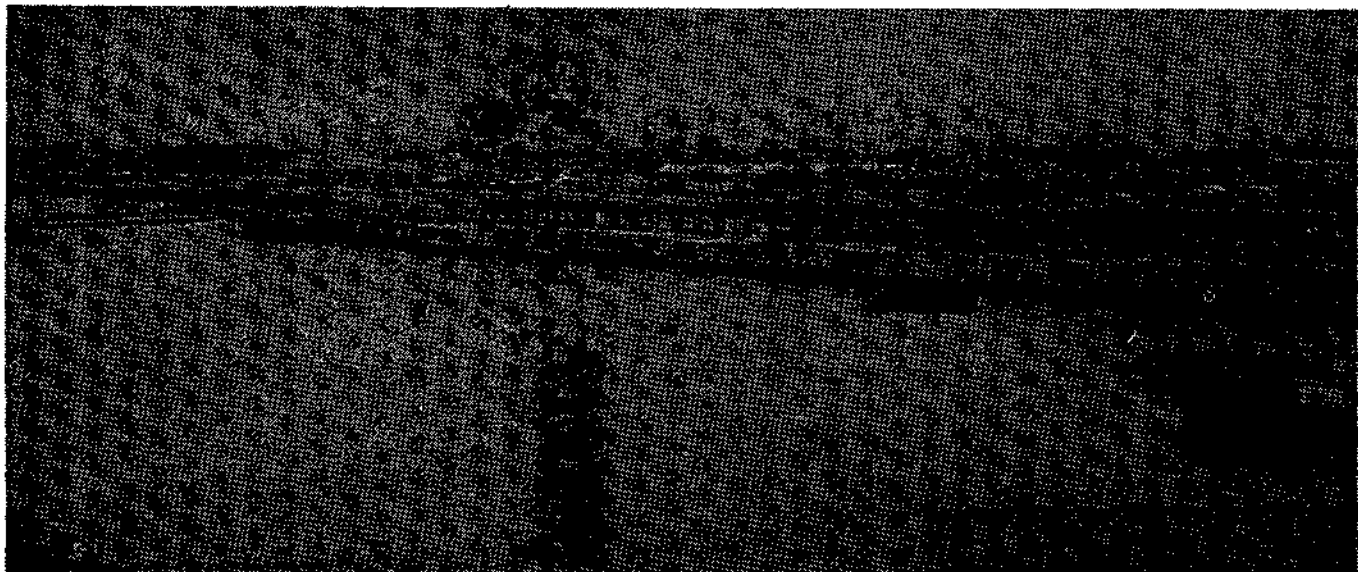
There are 16 warehouses and 10 sq. metres transit sheds comprising a covered area of 78,000 and 47,000 sq. metres respectively, with rail and road access available. These are served by 17. cargo lifts of 2-ton capacity. Bending facilities and separate stocking area for hazardous goods are also available. In addition, 200,000 sq. metres of open area for stacking is also available. Apart from this, 3 storage tanks of 10,000 tonnes capacity with shore to ship and vice versa pumping facilities are available for handling commodities like mutton tallow, molasses, edible oils etc. There are also 3 storage tanks of 10,000 tonnes capacity each for storage of phosphoric acid.

The Port has taken up the construction of a Fisheries harbour north of the Bharathi Dock, financed by the Ministry of Food and Agriculture, Government of India. About 40,000 tonnes of sea-food will be handled per annum in the first stage and 80,000 tonnes during the second stage. The Fisheries harbour will have a 6 m deep basin enclosed by two breakwaters. It will cater to 50 trawlers and 500 pablo boats initially and 150 trawlers and 500 Pablo boats ultimately. Provision has been made for establishment of fish based industries within the harbour premises.

The work on the construction of Eastern Breakwater is now in progress. The work on the construction of Northern breakwater is being taken up. This project is expected to be completed before 1978.

The following are the main schemes to be undertaken in the near future:

The Bharathi Dock can receive 42' draft vessels now. The immediate users of the Bharathi Dock viz. Madras Refineries and MMTC have indicated that they would like to bring vessels of upto 49' draft to achieve freight advantage. In view of this, it is proposed to deepen the Bharathi Dock and channel to receive such vessels in future.



A view of the mechanised ore handling berth at Bharathi Dock.

Meanwhile, the Madras Refineries has been asking for facilities to utilise the full 46' draft for their tankers. The Union Ministry of Transport sanctioned the utilisation of a chartered dredger which has dredged about 10.00 cubic lakh metres against a quantity of 12.25 cubic lakh metres involved for bringing in 45' draft tankers. It is proposed to undertake further deepening to cater to 46' draft tankers.

Remodelling of Boat Basin

With the considerable increase in the floating craft owned by the Trust, the existing boat basin is found to be inadequate for berthing the Trust's crafts. The capacity of the present slipway in the boat basin is not sufficient to take the Trust's dredgers. It is therefore proposed to remodel the existing boat basin and construct a dry dock of size about 122 m x 23m. The proposals are in the preliminary stage of design. The Government of India has sanctioned Rs 6 lakh towards preliminary survey and Consultancy services for dry dock.

The projected traffic of fertilizers during the Fifth Plan Period is about 1.5 million tonnes. It is proposed to provide mechanised handling facilities for handling the fertiliser. This scheme envisages provision of continuous unloading facility, conveying system, reclaimers, bagging, stitching and weighing. The facility is proposed to be provided at Jawahar Dock east after the berths become available

consequent to shifting of ore handling to Bharathi Dock. This is programmed for completion in 1978-79. In the meanwhile to handle fertilisers at a faster rate and standardise the begging it is proposed to utilise the existing South Quay I with the Transit shed for providing these facilities.

The Bharathi Dock comprising the oil berth and the ore berth under construction can be used for 12.80 metres draft vessels for only 9 months in a year. During the 3 months of North East Monsoon, restrictions on the draft and length of the ships berthed are imposed due to disturbances in the channel and turning circle. To make this an all-weather dock without any restrictions, an outer arm is felt necessary. Preliminary investigations have been completed and the project report is being prepared.

Its Problems

In 1949, exactly 25 years after the construction of the sand screen, it was observed that sand was trying to enter the approaches to the harbour. A land based dredger in the form of sand pump was installed and commissioned in 1949. It was estimated that by this measure about 30 to 40 per cent of the sand accretion could be tackled. A hopper dredger of 1500 tonnes capacity was procured during 1961. Another dredger of a capacity of 2000 tonnes was acquired during 1972. With this dredging fleet, it is hoped

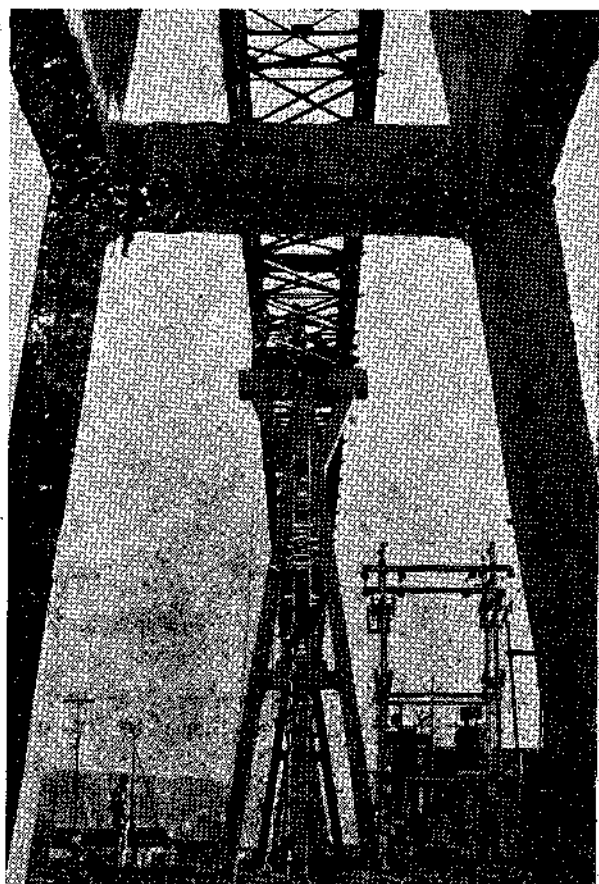
that the sand menace would be tackled to a great extent.

The strength of the Madras Dock Labour force is about 12,500. The relations between the management and labour have been generally satisfactory and the Port has been free from major strikes. This can be attributed to the reasonable attitude of the labour leaders on the one hand and on the other, the willingness on the part of management to settle disputes through discussion.

The trustees representing port labour have been taken into the Port Trust Board to look after the interests of the workers. In the matter of leave, provident fund, gratuity, pension etc. the same rules and regulations as are applicable to Government employees are applicable also to port labour. The Port Trust has also provided a number of facilities and amenities such as scholarship for the children of the employees, assistance from welfare fund, canteen, co-operative bank etc.

The Madras Port Trust Board has recognised two trade unions of the employees, namely, the Madras Port Trust Employees' Union, and the Madras Port Trust Railwaymen's Union. There is a great deal of understanding between the administration and these unions. The administration looks into the grievances of the employees promptly and, whenever necessary, holds discussions with the representatives of the workers in an effort to find a settlement. □

A view of the 4.8 km long automatic conveyor gallery at the Visakhapatnam Port to transfer iron ore from railway dumps directly on to 100,000 DWT ships anchoring at the outer harbour.



**Our
Major
Ports**

VISAKHAPATNAM

Yesterday, Today and Tomorrow

B. K. RAO

The growth of Visakhapatnam port over the past four decades has been phenomenal. It is a well protected deep sea port formed by an entrance channel. The port has adequate water supply and its own railway connected to the S. E. Railway and to many private sidings. Its hinterland is vast and rich, comprising the whole of Andhra Pradesh and Madhya Pradesh besides parts of Maharashtra and Orissa. Its total handling capacity which stood at 8.1 million tonnes in 1973-74, is expected to increase to 17.6 million tonnes.

If what makes for a port's prosperity are nature's kindness, dedicated men and modern machines then Visakhapatnam has all these in good measure.

ON the 7th of October, 1973 when 'JALA DURGA', a Scindia Steam Navigation Company vessel, entered the Port of Visakhapatnam, it heralded the birth of another major port of India. Till then, it was only a minor port on the East Coast of India.

In the four decades that have passed by, this natural port is preparing itself to receive ships of one lakh D.W.T. Visakhapatnam Port has, over the years, grown into a vital and strategic port of the country and with the eagerly awaited Visakhapatnam Outer Harbour Project entering another crucial phase, the port is poised for a leap forward.

Shri Rao is Chairman, Visakhapatnam Port Trust.

It was as long ago as 1858 that a special survey stressed the need for a major port between Madras and Calcutta. However, four decades had to pass before the Bengal-Nagpur Railway got into stride and brought Col. Cartwright Reid of the British Admiralty to take up the job. Col. Reid proposed the construction of the Inner Harbour at the Meghadrigedda river's mouth. The construction of the Harbour was commenced in 1922 and completed in 1933 when it was thrown open to ocean-going vessels.

To begin with the port was under the Railway Board. Then there was a series of changes at the helm. In 1964 when it was under the Union Ministry of Transport, the Visakhapatnam Port Trust was constituted to administer the port.

The Visakhapatnam Port Trust manages a teeming and complex organisation of over 10,000 men and hundreds of sophisticated machines to give efficient service to the shipping community in general and particularly in handling the export of iron ore to Japan. Administration, Civil Engineering, Marine, Mechanical, Traffic, Accounts, Research & Planning, Stores and Outer Harbour—are the different wings of this organisational set-up.

Full-fledged medical attention to all the employees is the responsibility of the Chief Medical Officer assisted by a team of medical officers. The Port Hospital has the most up-to-date equipment. Besides, the port has provided residential quarters and canteens, and encourages cultural and literary activities of the workers. Labour Officers look after the interests of the workers.

The Port's Capacity

A well protected deep sea port, Visakhapatnam can take in ships of length up to 195.07 mts. and draft of 10.20 ms. The port is formed by an entrance channel (1.62 kms. in length and 94.44 to 121.92 ms. in width) and marked with lighted buoys and beacons, and a turning basin (365.76 ms.) and 3 navigable arms, northern, north western and western.

The 'Island breakwater' of the port is a unique one in that two ships were scuttled to form the nucleus around which a rubble mound has been raised. A deep 'sand-trap' was formed by dredging between the hill called 'Dolphin's Nose' at the entrance of the Harbour and the south western end of the breakwater to the channel's edge. This sand-trap traps a million tonnes of sand a year that comes along with the

littoral drift from south to north on the east coast. The sand thus trapped is dredged and pumped through a floating pipeline or by a Hopper to the north of entrance channel.

Facilities

Aiding round-the-clock navigation at this port are three Light Houses, two Radio beacons, four Signal stations, three despatch vessels-cum-tugs and two pilot vessels. The Port has eleven Quay Berths, three Jetty Berths and four Mooring Berths in all and mainly handles exports of iron ore manganese ore, pig iron, iron and steel materials and imports of foodgrains, fertilizers, fertilizer raw materials and crude oil.

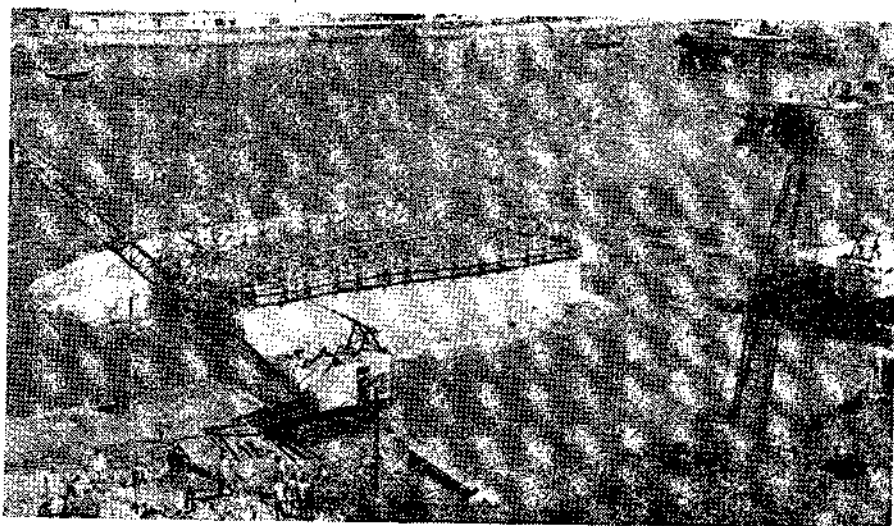
The Port's Mechanical Ore Handling Plant installed in 1965, has twin wagon dumpers, conveyor belts (total length 1947 ms.), Bucket Wheel Reclaimer (capacity 2,000 tonnes per

hour), and 2 ship loaders capable of loading 3,200 tonnes per hour.

It is a delight to see the slick and smooth operation of this system, which begins with the tipping of iron ore from the railway wagons and ends with the loading of the ore into the ships—the whole process taking not more than a few minutes. Installed as a part of Indo-Japan agreements (1958 and 1960) for exporting iron ore to Japan, this plant is being modified as per the prestigious Outer Harbour Project to load at a rate of 8,000 tonnes per hour. This capacity will further be geared up to handle 16,000 tonnes per hour.

Five transit sheds with a capacity of 36450 tonnes of cargo and a vast area of nearly 1.23 lakh sq. ms. are among the storage facilities the port offers.

The Port has adequate water



A partially built crib five metres high and 1,500 tonnes in weight is being launched at Visakhapatnam. It was later tugged to the site in mid-ocean, to be built to its full 23 meters height. The ore berth of the outer harbour is built upon eight such cribs.

Below : A view of the outer harbour.



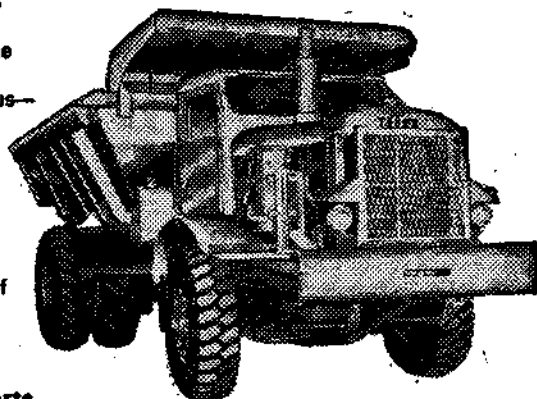
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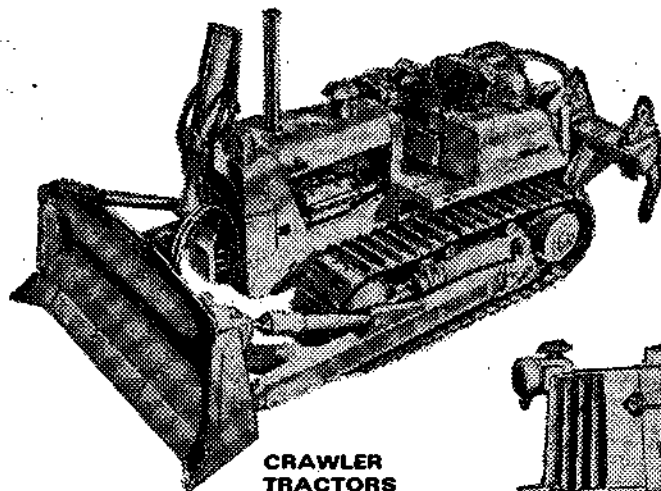
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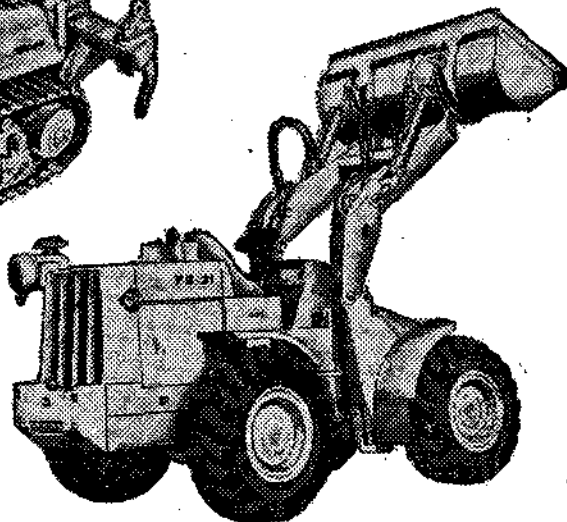


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supply and has three Water barges (2 of 100 tonne capacity each and one of 300 tonnes capacity) to pump fresh water to ships in moorings. The bunkering needs at the 3 jetties and oil berths are met by 300 tonne self-propelled and 150 tonne non-propelled oil barges.

The Port maintains a fleet of 5 dredgers, 7 tugs, 2 survey launches, 2 pilot launches, 2 mooring launches, 13 other launches, 7 hopper barges, 1 anchor barge, 1 fire-float, 62 vehicles, 11 tractors, 11 trailers, 2 shunters and 5 dumpers. There are 27 electric and 16 mobile cranes, 48 forklifts and 4 heavy-duty cranes including the pride of the port, the 150 tonne, self-propelled, floating crane 'Bheema'—the only one of its kind in the country.

Visakhapatnam port has its own Railway with a total length of 130 km. well connected to the South-Eastern Railway and to many private sidings. Keeping the goods on the move are 28 broad-gauge and narrow gauge locomotives, four of them steam-powered and the rest diesel powered.

Keeping this fleet of crafts and vehicles in good trim is the full time job of two well-equipped workshops.

The Port has a Dry Dock mainly meant for the Port's craft. The dock which is 137.16 km. in length, 18.44 ms. in width and 5.63 ms. in depth can take in ships 122 ms. in length, 4.87 ms. in draft.

The hinterland of the Port commands an area of 340,600 sq. kms. spread over Andhra Pradesh, Madhya Pradesh, Maharashtra and Orissa, the former two alone accounting for 80 per cent of the area. The points of origin of the export traffic and the

points at which the import traffic terminate are (according to the Traffic Survey conducted by the National Council of Applied Economic Research in 1970) concentrated in the north-eastern parts of Andhra Pradesh, Southern Madhya Pradesh and Southern Orissa. Some traffic movements extend beyond the above region. With the development of port facilities at Mormugao, Madras, Paradip and Haldia, the only ore traffic that might go through Visakhapatnam in the future would be iron ore from the Bailadilla ranges in the Bastar District, Madhya Pradesh and Andhra Pradesh. Similarly iron and steel exports originating only in the hinterland can be expected in the future to be shipped through Visakhapatnam as Haldia and Paradip are much nearer the steel plants of Bihar and Orissa. The main imports from Visakhapatnam in the future are likely to be crude petroleum, fertilizers and fertilizer raw materials. The projections of traffic of the Visakhapatnam port, as worked out by the 1970 survey is given in the table below:

Over the past decade, Visakhapatnam Port has received on an average more than 600 ships per year (except in 1972-73) when it touched a low with 563). In 1973-74 a total of 616 ships including 519 foreign ones called at this Port.

From its very inception, the major commodity handled at Visakhapatnam has been ores. For a long time, till the early fifties, manganese ore was the principal commodity handled and from 1952-53 iron ore also came to be handled by this port. Now the quantity of iron-ore exported from this port has outstripped

manganese. The total cargo handled at this Port rose from a mere 0.6 million tonnes (1947-48) to 8.1 million tonnes (1973-74). The peak was 8.7 million tonnes in 1970-71. The cargo of 8.1 million tonnes (1973-74) consisted of iron ore (51.9%), petroleum and petroleum products (25.1%), fertilizers and fertilizer raw materials (9.1%) general cargo (8.7%) and foodgrains (5.2%).

In 1972-73 all the major ports of India together handled a total cargo of 58 million tonnes and of these 7.5 million tonnes passed through the Port of Visakhapatnam. The port's revenue in 1972-73 was Rs 9.9 crores and expenditure Rs. 8.2 crore, leaving a working surplus of Rs. 1.7 crore.

Outer Harbour

Visakhapatnam Port's most ambitious programme till date is its Outer Harbour Project, now in the final stages of completion. On completion of this Rs. 72 crore project, the Port will be the only one of its kind between Tokyo and Rotterdam to take 1 lakh D.W.T. carrier alongside. The Visakhapatnam Outer Harbour will have 3 breakwaters on the south, east and north measuring 1543, 1070 and 412 ms. respectively. These will create an entrance channel 1500 ms. in length and 17.5 ms. in depth, a turning basin with a diameter of 610 ms. and depth of 17.5 ms. and a projected basin of 200 hectares.

By 1978-79 an annual export of 12 million tonnes of iron ore is envisaged and this project is fully geared to take up the challenge. Towards this end, the construction of a jetty-type iron ore berth to take in 2 ore-carriers simultaneously on either side, forms the nucleus of this project. The jetty will have a ship loader with a capacity of 8,000 tonnes per hour, which can be doubled, if necessary. A salient feature will be the transferring of the ore through a mechanised overhead conveyor system, the length of which is about 4.78 km. Dust will emanate from this overhead galley, to eliminate which, protective measures will be taken. The Mechanical Ore Handling Plant will be strengthened with more/modified belt conveyors, two stackers of 4,000 tonnes per hour capacity each and an additional Bucket Wheel Reclaimer etc. A Fishing Harbour in the north portion is another important feature.

The Outer Harbour will have the potential for more and bigger berths to receive big colliers and super tankers. A ship building complex for constructing bulk-carriers is also a possibility.

Projections of Traffic at Visakhapatnam Port

(Thousand tonnes)			
Year	A	B	C
1967-68			
Imports		2,414	
Exports		4,197	
Total		6,611	
1973-74			
Imports	3,130	3,132	3,142
Exports	7,663	8,817	8,842
Total	10,793	11,949	11,984*
1978-79			
Exports	4,158	4,217	4,634
Imports	12,100	12,945	12,970
Total	16,258	17,162	17,604
1983-84			
Imports	5,190	5,208	5,836
Exports	13,683	14,510	14,570
Total	18,873	19,718	20,406
1988-89			
Imports	6,235	6,261	7,104
Exports	15,468	16,167	16,047
Total	21,703	22,428	23,151

*Actuals for 1973-74: 8.1 million tonnes.



MORMUGAO

Prospects and Problems

Any major industrial development necessarily hinges on the proper development of an efficient infrastructure in support of such industrial growth. Goa is specially fortunate in this respect on account of the existence of the major Port of Mormugao with its efficient and cheap inland waterway transport links. A major port facility is a crucial part of the infrastructure of a region's economy as also a catalyst for accelerating the pace of economic growth in the region. This basic structural relationship is of special significance because of the inter-dependence that exists between the Port of Mormugao and the economy of Goa.

R. J. MAJITHIA

MORMUGAO is a magnificent, spacious natural harbour, well protected from the force of the south west monsoon by a large promontory. It is situated on the left bank of the river 'Zuari' on the west coast of India being about 250 miles south of Bombay and 360 miles north of Cochin, having a vast and rich hinterland comprising the south western region of the country.

Mormugao Port is passing through a momentous phase both in terms of traffic growth and development efforts. Possibly, more has happened at Mormugao during the last one decade, than in its chequered 73 years of pre-liberation existence. During the last seven years, its annual traffic has increased by 100 per cent, reaching a coveted level of 14.34 million tonnes in 1973-74, there is no parallel in the case of any other Indian port. Among all the Indian ports, Mormugao today handles the second largest traffic tonnage per annum, coming only after the port of Bombay. It is also India's leading ore-port, handling about half the total iron ore exports from India. It is a matter of distinction for Mormugao that the Port's iron ore exports taken individually or with other Indian sources constitute the second largest source of ore imports for Japan at present. This is a historic pattern that has continued ever since iron ore exports started from the country. With the passage of time, the position will be further entrenched.

The present facilities at the Port mainly consist of a fine natural harbour which can hold about 50 steamers at a time in the fair season

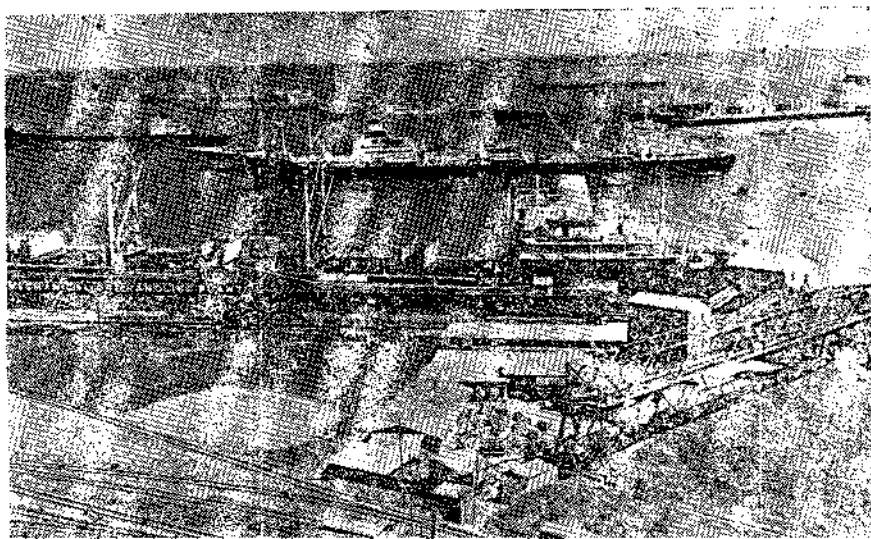
and 15 steamers at a time during the monsoons, and six berths, including a berth where a privately-owned mechanized ore-handling plant is located. This berth loads iron ore upto 1,000 tonnes per hour, and also provides facilities for discharging mineral oils from oil tankers. The other berths are equipped with cranes and other cargo handling equipments, sheds and warehouses with rail sidings, etc. and handle both ore traffic and general cargo. Vessels can be loaded upto 28' to 30' draft at the berths, upto 30' draft at the moorings/ anchorages inside the harbour, and upto 45' draft in the sea-anchorages in the outer harbour.

A good part of the ore traffic at the Port is handled at the moorings and anchorages in the harbour where ore brought in by barges from the mines in Goa is directly loaded into the steamers by manual operations. In fact, it is this facility of cheap river transport from the nearby mines direct to the steamers in harbour that has made Goan ore competitive in the world market. During 1973-

74, out of a total of 14.34 million tonnes of traffic handled at the Port 80 per cent was handled in the stream, 11 per cent was handled at the mechanized berth and 9 per cent at the other berths. This pattern, with the dominant share being handled manually in stream, is expected to change radically after the completion of the new mechanized ore berth included in the Port's Development Project under way, when the entire iron ore traffic from stream and other berths will switch over to the new mechanised berth.

While dealing with the traffic pattern and performance, it is important to mention that the traffic through the Port has got considerably diversified in the recent past, and its service area has also considerably increased. Apart from the growth in ore traffic (13.08 million tonnes of iron ore, and 0.5 million tonnes of manganese ore in 1973-74), a large quantity of mineral oil traffic is also being handled at this Port, this traffic having gone up from 3.8 lakh tonnes to 5.5 lakh tonnes during

Ships anchored at Mormugao Port



Shri Majithia is Chairman, Mormugao Port Trust.

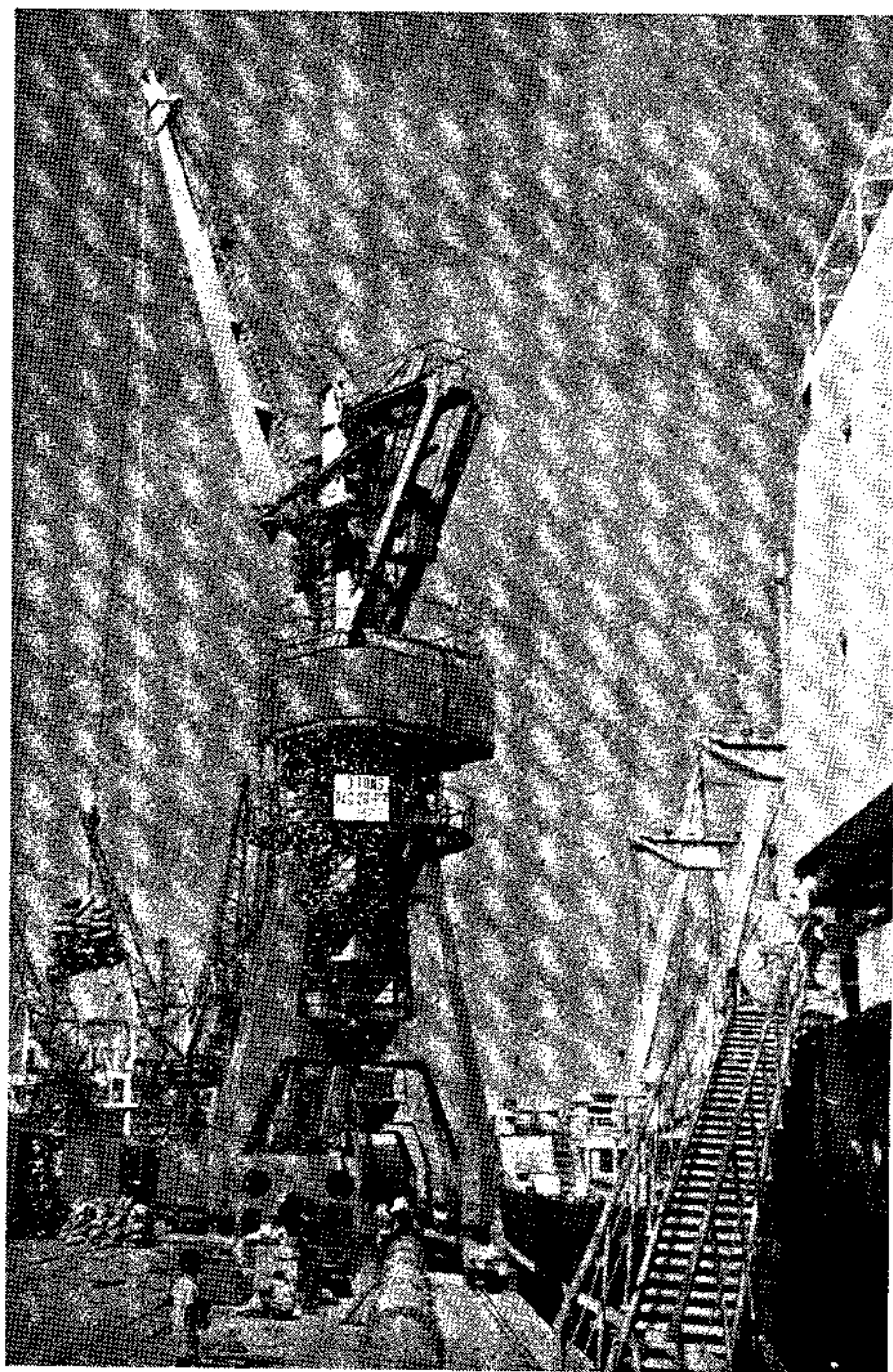
the past year alone. The Port is also handling a growing volume of oilcake exports, whose traffic, at about 90,000 tonnes during the last year, showed a nine-fold increase over the oilcake traffic through the Port in 1964. Oilcake is now coming to Mormugao for export from different parts of Karnataka, Andhra Pradesh and Maharashtra.

Port Problems

Problems of this Port, like those of Indian ports in general, are mainly developmental in nature. The most crucial problem is expansion and development of modern port facilities. One may refer here to the purely dimensional aspect of the problem. Figures of port development in India vis-a-vis the development of ports in other countries of much smaller size tend to indicate the relatively under-developed stage of our ports. The quantum of traffic handled by our major ports increased from 21 million tonnes in 1960 to 58 million tonnes in 1972-73. While this is a phenomenal rate of increase, the figure will make a depressing reading when compared with the port traffic attainments in many other countries of the world. The Port of Rotterdam alone handled 268.5 million tonnes of traffic in 1972; which is more than four times the total traffic of all Indian major ports together, and the Port of London handled 54 million tonnes, nearly equal to the total traffic of all the major ports of India. The growth of port traffic in some of the Japanese ports also presents a similarly striking contrast.

While these comparisons emphasize the dimensional and quantitative aspects of the developmental problems of our port, there is also the qualitative aspect of such under-development, which poses a growing problem in view of the revolution that has recently come about in several aspects of international shipping with which any important port of the day has to cope with. We may briefly mention three main areas in which revolution has taken place. These are:

- (i) The revolution in ship sizes particularly in bulk cargo trade, the capacity and draft of ships in use, reaching dimensions which one would not have even dreamt of as recently as a decade ago;
- (ii) The revolution brought about by the unit load system for handling general cargo, culminating recently in the advent of the containerized cargo and container ships in a big way in the major sea routes of the world; and
- (iii) The revolutionary require-



A view of Mormugao Port.

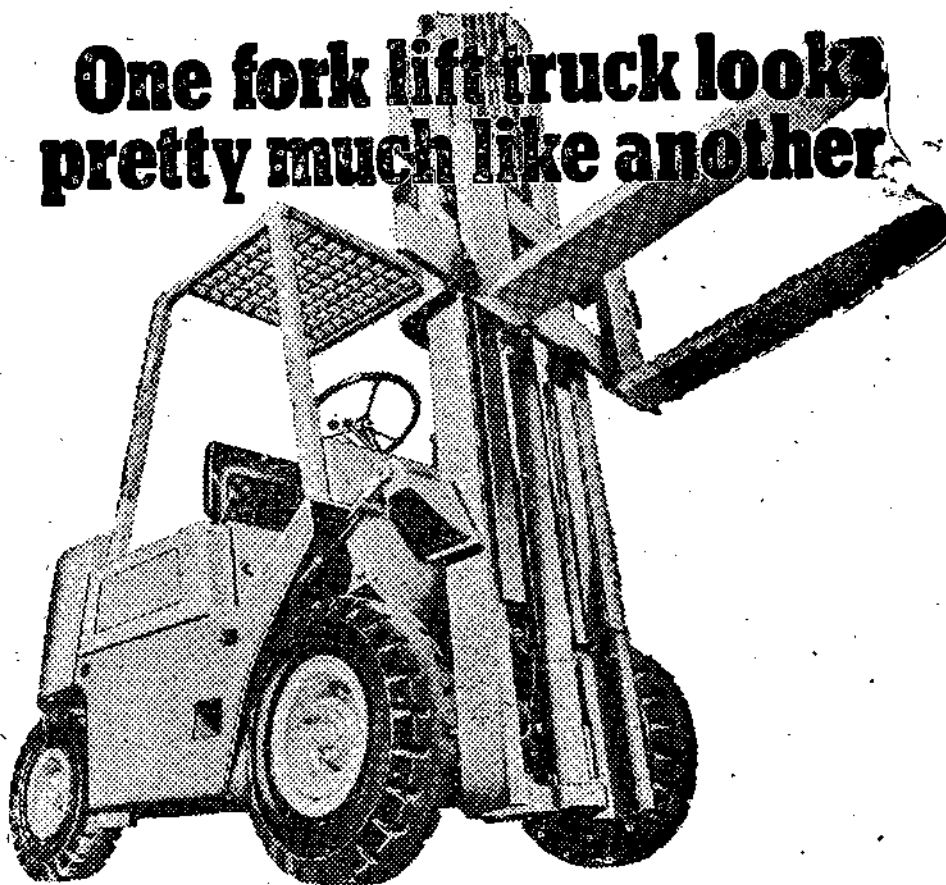
ments of having to handle cargo at the ports at a fantastic rate of turn-over whether in bulk or general cargo trade, so as to realize the economies of the larger-sized and expensive ships in operation.

All these revolutionary changes have obviously created a special problem of what may be called the *technology-gap for Indian ports* in general and we are indeed labouring hard to tune up with the changing times. In a sense, the very concept of ports has changed, the 30' draft which was the accepted norm for our major ports for a number of

years giving way to much deeper drafts, say upto 54' in the immediate future, and the rate of cargo handling changing from the present about 2,000 tonnes per day to say 100,000 tonnes per day. The major problems of the 'technology-gap' is thus being sought to be solved in a selective way in India, even though the progress is necessarily slow, particularly on account of the resources constraint, the foreign exchange shortage etc., faced by the country at present.

Mormugao Port, even as other major ports in the country do, suffers from trade and indigenous technical know-how with reference

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to the planning and design for specialised port facilities. The result is that we are required to lean heavily on foreign consultants for the preparation of our Master Plan and design studies. The shortage of indigenous capacity for producing necessary handling equipments and the dredgers required for port development also remains a major problem for the development of Mormugao Port. Particularly for the capital dredging equipment, we are still at the mercy of foreign countries with the result that major dredging operations have been entrusted to foreign contractors. In the case of handling machinery, however, we have been largely successful in building up sufficient indigenous capacity.

It may however be added that Mormugao Port's record in solving many of these questions has been creditable.

Future Possibilities

During the Fourth Five Year Plan, considerable planning was undertaken for the development of port facilities at Mormugao with special emphasis on handling of mineral ores in an expeditious and economic manner so as to make the Goan ore competitive in the international market.

As a first step in planning the development of the Mormugao Port, the well-known consulting engineering firm of M/s Rendel, Palmer & Tritton prepared in February, 1965 a Master Plan for the development of the Port. Thereafter, M/s Howe (India) Pvt. Ltd., were appointed in February 1966 to prepare a design study for the establishment of modern ore handling facilities at the Port. Based on the report of M/s Howe (India) Pvt. Ltd., a proposal for the development of the Port was submitted for the consideration of the Government in September 1969.

The Mormugao Port Development Project sanctioned by the Government in 1970 includes the following major items of work:

- (a) Installation of a mechanized iron ore handling facility for receiving, stock-piling, reclaiming, weighing, sampling and shiploading of 12 million tonnes of iron ore per annum. The rated loading capacity of the ore handling system to be of the order of 8,000 tonnes per hour and the mechanical equipment to be designed to permit initially, the loading of 60,000 dwt. ore carriers, and subsequently 100,000 dwt ore carriers. To enable 60,000 dwt vessels to be brought in alongside the

new ore berth at all the stages of tide, the Project includes the work of dredging and reclamation where suitable material obtained from dredging is to be utilised for reclaiming from the sea, an area of about 70 acres of land. The berths have been suitably designed so as to cater for 100,000 dwt. ships after further deepening in due course.

- (b) Provision of facilities at the Port of Mormugao in connection with the handling of traffic other than iron ore. This included the construction of the oil berth and improvements to the existing facilities by the construction of new transit sheds, remodelling of the existing warehouses, improvements to pavements inside the dock area, acquisition of fire-fighting equipment, roads, drainage and ancillary facilities.
- (c) Acquisition of new cargo handling equipment and new wagons and locomotives.
- (d) Acquisition of a new Hopper Suction dredger and the Grab Hopper dredger to cater for the increased maintenance dredging, and two high-powered tugs for handling of bigger ships.
- (e) Provision of night navigational facilities.

Since more than 90 per cent of the Goan ore exported through the Port of Mormugao is brought to the Port in barges, through the inland water transport system, the development of the Port includes an unique feature which constitutes the most important adjunct of the proposed ore handling facility, viz. the construction of 4 barge jetties each 127 m. long and 14 m. wide capable of accommodating iron ore barges upto 2,000 tonnes capacity, equipped with mechanized facilities.

The Mormugao Port Development Project is scheduled to be completed by 1976, and is expected to cost about Rs 64 crore.

The unique combination of Goa's natural endowments—a natural harbour, a large net-work of inland waterways, rich mineral resources, and the industrious nature of the people—makes for innumerable advantages in industrial location, the potential for which, in a sense, has only just started to be tapped.

In addition to further expansion of the mining industry, the Goan economy is already passing through the first stage of what is almost an industrial revolution—with a port-based massive fertilizer and chemical complex, ore-pelletization units, units

in textiles, food-processing, pharmaceuticals etc., developing in a big way almost for the first time within the territory. One should say that all these mark only the beginning of much bigger and rapid changes that may be expected in the industrial horizon of Goa, mostly under the impact of the new major facilities coming up at the Mormugao Harbour. It seems certain that in the distant future another port-based industrial venture of far-reaching importance, namely, an oil refinery and a petro-chemical complex based on it, may come up in Goa. The new deep-water-facilities for handling mineral oil, being created at Mormugao as part of present Port Development Project will facilitate the transport of crude oil and finished products in big tankers, while the larger number of ships moving in ballast to Mormugao Harbour for lifting iron ore will confer special economies in ocean freight for importing crude for feeding such a refinery. The scope for an export-based steel plant and for other export-based industries like calcinated petroleum coke, sugar manufacture, cement manufacture, food-processing etc., will also increase greatly with the further development of the port facilities.

The peculiar feature of about 600 ships arriving at Mormugao in ballast to load ore throws up a fortuitous advantage in transportation circuit which is bound to open up possibilities of import of raw materials and intermediates for export-oriented industries in a free trade zone. Similarly, regular call by well over 700 ships at the Port and regular and continuous plying of about 350 barges in the internal waterways of Goa indicates bright possibilities of ship-repair and light engineering industries springing up on the entire water front of Goa's beautiful rivers—'Mandovi' and 'Zuari'. A good ship-repair base will ultimately make out a case for a shipyard which will be the natural culmination of the Port and the allied engineering complex. These are all possibilities within our reach however ambitious they may seem today.

The effect of port development may be immediate and phenomenal in some sectors, while it may be only slow and marginal in others. One may almost say that Port development will bring about strong winds of change in some sectors, like fertilizers, chemicals, food-processing, ore-pelletization etc.

In sum, under the impact of the Mormugao Port's development, the seventies will mark a crucial phase in the industrial development of Goa. □

Our Major Ports

KANDLA

Offspring of Partition

Born after Independence, Kandla is a port with a bright future. Protected from vagaries of weather, this is a round-the-year port with a relatively deep draft and a vast hinterland comprising some of the richest food growing and industrialised States. Though equipped with modern facilities, it lacks adequate liner service and this will improve as its popularity with the shipping lines grows.

R. P. BHARGAVA

(9.25 metres). The apron of the cargo jetty berths is as wide as 75 ft. (22.6 metres) and has 3 dual-gauge (Metre-gauge and Broad-gauge) railway lines. Five large size vessels or 6 medium size vessels can be accommodated on these jetties.

(ii) Six swinging busy mooring berths have been provided, out of which 3 are reserved for general cargo ships, one for deep draft vessel, one mooring berth for salt ship and one for ship carrying explosives. The depths at these moorings varies from 7 metres to 12 metres.

(iii) RCC Pier for handling P.O.L. and other bulk liquid chemicals has been provided. Three pipelines 2 for white oil and ore for black oil with diameters 305 ms, 356 ms and 406 ms, connect RCC jetty with the Oil installations. New Second Oil Jetty where modification work is in progress is expected to be commissioned by the end of 1974. On commissioning of this jetty, it would be possible to accommodate 2 oil tankers with an aggregate length of about 341 metres.

(iv) Three wharves at bunder basin, one for handling goods from the barges with shore cranes, one for

handling goods from sailing vessels manually and one for handling heavy lifts upto the capacity of 60 tonnes have been provided.

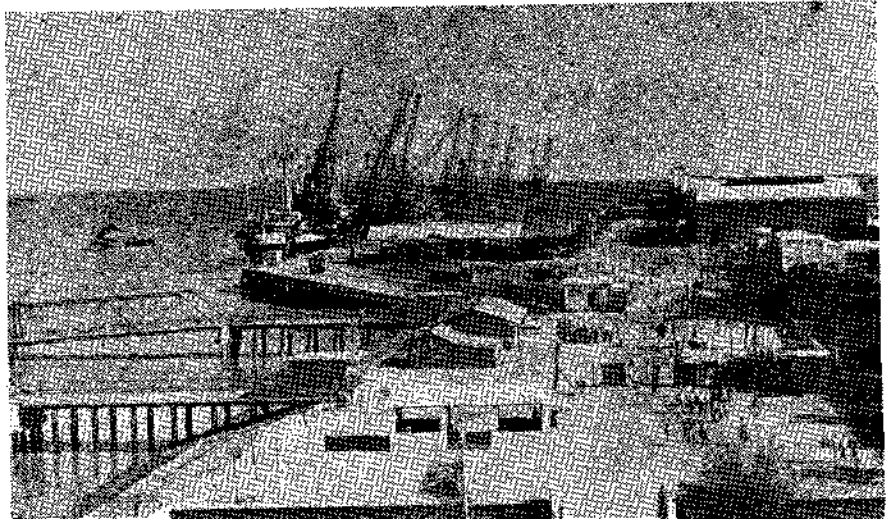
(v) A jetty for handling fish cargo is also provided in the bunder basin. The Government of Gujarat has provided cold storage space for fish cargo near the jetty.

(b) *Storage facilities:* (i) Storage facilities include 3 single storeyed transit sheds at cargo jetty area, each with a storage capacity of 5,000 tonnes general cargo.

(ii) Two temporary transit sheds have been provided, one north of the transit shed with a storage capacity of 2,000 tonnes and the other between the transit sheds with a storage capacity of 26,000 tonnes.

(iii) Four double-storeyed warehouses with a capacity of 15,000 tonnes each for uniform type of cargo have been provided. Each warehouse has cargo lifts, two of 2 tons and two of 4 tons capacity for movement of cargo from ground-floor to first floor and vice-versa. Three vegetable oil tanks with a total capacity of 650 tonnes have also been provided. One of the warehouses is equipped with

A panoramic view of the cargo jetty.



CONSEQUENT upon the loss of Karachi Port after the partition of the country, the Government of India set up an expert Committee known as the West Coast Major Port Development Committee under the Chairmanship of Shri Kasturbhai Lalbhai to investigate, *inter alia*, the need for a major Port north of Bombay and to make recommendations on its location. On the recommendations of the Committee, the Government of India decided to develop Kandla in Kutch as a major Port. The actual construction of the jetties was started in 1953 and the first berth on the cargo jetty was opened to traffic in 1957.

Kandla is situated on the west bank of the Kandla Creek about 290 km away from the open Arabian Sea in the State of Gujarat, and at the eastern end of the Gulf of Kutch. Kandla Creek has deep water and is fully protected against the vagaries of weather. The Port has a vast hinterland of 256,000 sq. km. which includes Rajasthan, Punjab, Haryana, Delhi, Himachal Pradesh, Jammu and Kashmir, parts of Uttar Pradesh and Madhya Pradesh and Gujarat.

Facilities

Kandla Port provides modern facilities for handling all types of goods which include:

(a) *Berthing facilities:* (i) Five alongside berths at cargo jetty have been provided, all in straight line, with a total quayage of 1165.35 metres. The designed depth of the water alongside these berths is 32 feet

Shri Bhargava is Secretary, Kandla Port Trust.

automatic water sprinkler and fire-alarm system for the storage of cotton and such other combustible cargo. The first three warehouses situated behind transit sheds are connected with their respective transit sheds by over-bridges at the first-floor level.

(iv) The Dangerous Cargo Shed of 320 tonnes capacity and Calcium Carbide Shed of 48 tonnes capacity provided for the storage of dangerous/hazardous goods. Three Fertilizer Sheds with a total storage capacity of 10,000 tonnes are also available.

(v) Behind the warehouses, there is open stacking area for the storage of bulk as well as packaged cargo not requiring covered space.

(vi) There are two transit sheds at bunder basin, one on the south-wharf with a capacity of 2500 tonnes and the other on north-wharf with a capacity of 1000 tonnes.

The cargo handling equipment provided by the port includes 21 electric level luffing quay cranes at cargo jetty berths—16 of 3-ton, 4 of 6-ton and 1 of 10-ton capacity.

Four electric level luffing quay cranes at south-wharf shed at bunder, 2 of 3-ton, 1 of 6-ton and 1 of 10-ton capacity, one 60-ton gantry crane at west wharf, one crane of 2-ton at Fishing Jetty, four mobile cranes, two of 3-ton and two of 6-ton; six forklifts, one of 6-ton, three of 6-ton and two of 2.5-ton lifting capacity. Two platform trucks of one-ton carrying capacity/2 towing tractors with 4 trailers.

Mechanical handling equipment like Vacuvator machines and automatic scaling and bagging units for discharging foodgrains in bulk from the tankers and bagging thereafter, have been installed by the Food Corporation of India.

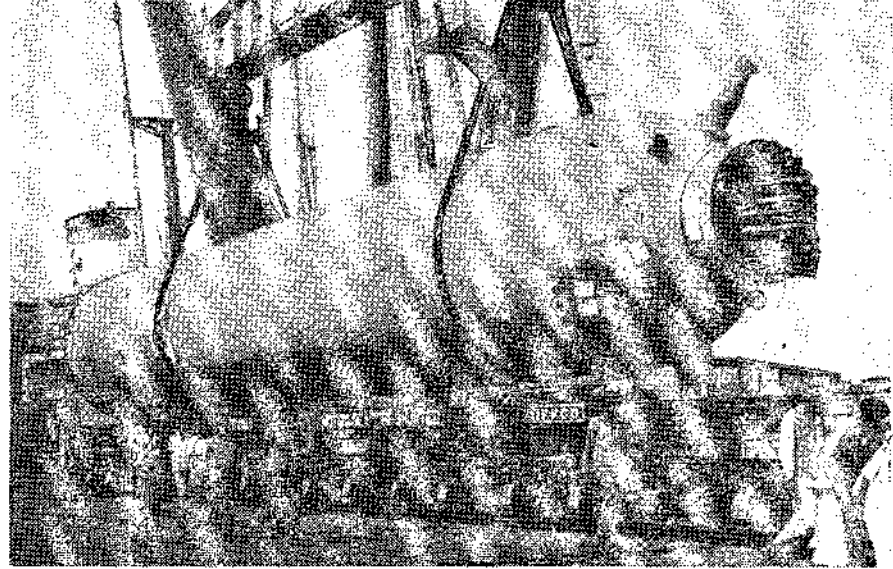
Transport Arrangements

The Port is connected with its hinterland and the rest of the country by metre gauge as well as broad gauge railway system and also by National and State Highways. All transit sheds, warehouses and open yards are liberally served with railway lines both broad gauge and metre gauge and with roads.

Drydock Facilities

A floating RCC Dry-dock to accommodate crafts upto 73 metres (240 ft.) in length and 3.4 metres (11 ft.) draft, having a maximum weight of 500 tonnes is available for repairing under-water fittings.

Power to the Port is obtained from the Gujarat Electricity Board through their Thermal Power Station at Kandla, which has a capacity of 16 MW. The Port has a standby diesel



A 250-tonne package being landed on to a specially built railway wagon at Kandla.

generated Power House with a capacity of 0.70 MW.

Adequate supply of water to the ships alongside cargo jetties and RCC jetty can be maintained through shore pipelines. Water to the vessels in stream can be effected through the Water Barge 'TUSHAR' having 200 tonne capacity.

A fleet of tugs and launches is maintained to transport the cargo to and from ships at moorings. The Port will soon acquire 6 steel barges each of 150 ton capacity.

Vessels calling at Kandla can take oil bunkers from the installations of various Oil Companies situated at Kharirhar at a distance of 9 kms. from the Port. The bunker is delivered to the ships by tank lorries.

The Port has one trailing suction dredger with a capacity of 800 cu. mts. to undertake the dredging work in the approach channels alongside the berths. The Port Trust is soon to acquire a new trailing suction dredger of 2500 cu. mts. hopper capacity to augment the existing dredging capacity. A small grab dredger with 3 hopper barges is also available.

The approach channel from the Pilot Station, which is about 15 nautical miles from the harbour, is adequately marked with lighted navigation buoys of the international standard, thus affording safe navigation during day and night. Qualified pilots are employed by the Port Trust to handle ships efficiently from and to the Pilot Station.

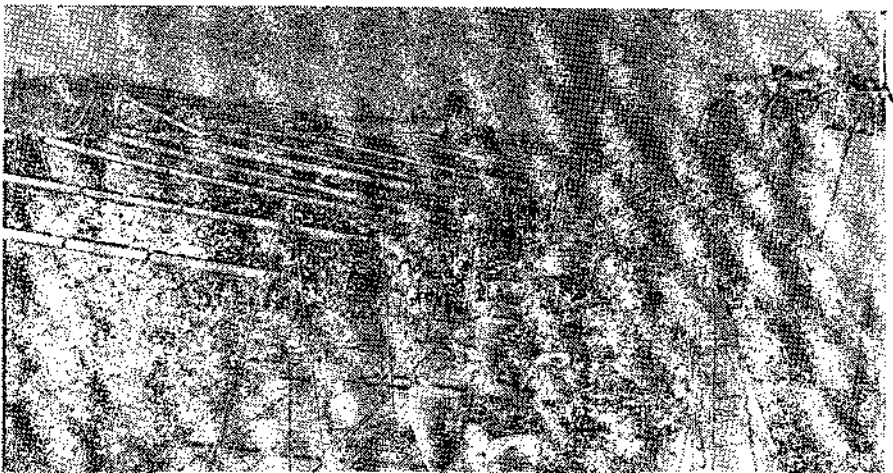
Communication Facilities

The Port has adequate communication system both visual and VHF and WT Radio communication which enable the Port Authorities to remain in touch with the ships.

Labour

The Port Trust handles packaged cargo on shore. For this purpose the Port has 500 workers in 'A' & 'B' categories. Whenever demand of the labour exceeds the availability casual workers are recruited on daily rated basis. Stevedoring labourers are employed by the stevedores through the Kandla Dock Labour Board. The present strength of this labour is 500 registered workers. The Food Corporation of India employs about 1700 workers under listing scheme of Dock Labour Board.

A grain ship discharging Vacuvator at Kandla.



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for handling foodgrains and fertiliser. The relations between the Port Administration and the Trade Unions controlling the labour in the Port, are characterised by utmost cordiality. The Port's working has generally been free from major strikes. Bulk cargo on shore is handled by labour employed by the importers or exporters.

On the basis of the Traffic Survey Report made by a senior Railway Official, Kandla was expected to handle about 8.5 lakh tonnes of import and export traffic 5 years after the cargo jetty berths were commissioned. This estimate was exceeded in the year of commissioning of the cargo jetty berths viz., 1957. Thereafter the traffic went on increasing and the Port handled the highest tonnage of 26.16 lakh tonnes in 1966-67. The handling of such a large quantity became necessary on account of large imports of foodgrains during years of food scarcity. Thereafter the traffic decreased and in 1970-71 only 16.12 lakh tonnes were handled, due largely to stoppage of imports of foodgrains.

With Port facilities thus rendered surplus, efforts were made by the Port Administration to develop import and export of stable commodities. Traffic picked up in the following year with the addition of new commodities like guar gum, engineering goods, tea etc. Thereafter the traffic went on increasing and a record tonnage of 31 lakh was handled during 1973-74.

Composition of Traffic

Main commodities of import & export traffic are:

Import: P.O.L., foodgrains, fertiliser, rock-phosphate, sulphur, potash, food products etc.

Export: Salt, crushed bones, Sugar, tea, guar gum, rice bran and engineering goods.

Average monthly quantity of cargo received and despatched during the period from January 1974 to August 1974 are as under:

	Average quantity Landed/ Received	monthly in tonnes Cleared/ Shipped
Import Cargo	1,06,865	1,07,914
Export Cargo	25,132	22,705

Future Traffic

The Port is expected to handle a tonnage of 3.8 million by the end of the Fifth Five Year Plan. To meet the increasing demand of the traffic, the handling capacity of the Port

has to be stepped up. For this purpose the following additional facilities have been created:

1. Modification of the second oil jetty so that two oil tankers can work simultaneously. This work is already in progress.
2. Provision of an additional 14" pipeline for handling P.O.L. traffic.
3. Provision of a flushing pump at the oil pier.
4. Installation of a mechanical unloading plant for fertilizer and its raw material. This work is already in progress. The ultimate capacity of this plant is to be 10,000 tonnes per day. The work is expected to be completed by 1975.
5. Provision of a mechanical salt loading plant. This proposal is still under examination.
6. Provision of a separate jetty for berthing vessels bringing phosphoric acid and or rock-phosphate for the Indian Farmers Fertilizer Co-operative Ltd., at the foreshore of their factory site.
7. Provision of an additional high powered dredger to deepen the channel sufficiently so that ships drawing 32' draft can be brought in on all days of the year and decreasing the waiting period for favourable tides.
8. Provision of an additional general cargo berth.

Kandla Has Its Problems

Kandla is a Tidal Port. Ships entering the harbour have to negotiate the shallow bar at the mouth of the Kandla Creek at or near the high tide. The Port has problems of siltation which have been studied in detail by hydraulic model experiments at the Central Water and Power Research Station, Poona. On the basis of such studies the Port authorities have taken action to prepare for future requirements so as to be able to cater to the increasing size and draft of ships. So Kandla plans to acquire a new dredger of 2500 c.m. hopper capacity. It is also planned to improve the draft position by deepening the present depths by about 1.22 metres (4 feet). Dredging operations at the bar are being carried out with the existing dredger. The Port now maintains a minimum depth of 14 ft. (a little over 4 metres) after dredging.

Despite the excellent cargo handling and storage facilities and also its favourable geographical location the exporters and importers are not using the Kandla Port to the full extent.

A major handicap is lack of adequate regular liner service from Kandla to different countries. As a result, most of export cargo originating from the hinterland of Kandla is passing through other Ports particularly Bombay and Calcutta. The shipping lines are being induced to operate regular service. Now a monthly regular service has been established from Kandla to U.K., continental Ports and U.S.A. ports. However, since the trade of the country is expanding and fresh markets in South East Asia, Persian Gulf and East African regions are being tapped it is essential that there should also be regular liner service from Kandla for Ports of these regions.

The area around the Port of Kandla gets a mild monsoon. The average rainfall is about 12" and this enables the vessels to work almost round the clock on all days of the year. Except on those days when monsoon rains are heavy, the rainy period is mostly localised in months of July and August. The dry climate, therefore, has a distinct advantage to the shipping trade.

The Port has been constructed in a comparatively virgin area and considerable land is available for the setting up of industries both large and small.

The apron of the cargo jetty berths is 22 mts. wide, has 3 dual gauge railway lines which run under the wharf cranes, facilitating direct loading and unloading of goods from/to wagon to/from ships. Wide wharf has also facilitated the handling of heavy lifts discharged directly by ship Jimbo derrick on special trailers. Heavy lift weighing 246 tonnes was handled safely on the wharf.

Two fork lift trucks with a maximum fork height of 213" are available for use in hold of the loading vessels to stack palletised cargo beyond the standard height of 144".

Each transit shed and warehouse is provided with loading platform, the level of which is in line with the floor level of the wagon. This facilitates quick and smooth loading and unloading of goods to and from the wagons.

Free Trade Zone

The Free Trade Zone of Kandla has been set up at a distance of 9.6 metres from Kandla Port as an export promotion measure. The Zone has been developed as a full-fledged industrial estate with attendant facilities needed for setting up factories for the production of goods for export. □



PARADIP

Symbol of Orissa's Progress

B. B. MOHANTY

A deep-sea port with an ideal location, the Paradip is also endowed with a vast hinterland of rich potentiality. Coal, iron ore, chrome, graphite and manganese in which the hinterland abounds constitute the base of its economy. With the completion of the Fisheries Harbour and Fertiliser Project, Paradip promises to become the heart-beat of Orissa's growing economy.

PARADIP in Orissa is a deep sea Port located on the eastern coast of the country midway between Calcutta and Visakhapatnam. It was declared a minor Port in 1958. The Government of Orissa developed it into an intermediate Port. The Central Government took over the Port in June 1965 and it was declared a Major Port in 1966. The Port is situated on the latitude 20°-14'-55.6" North and longitude 86°-42'-14" East.

The Paradip Port is fortunate to command a vast hinterland rich with mineral resources and agricultural and forest products, the major economic activities of its immediate hinterland being agriculture and mining. The Geological Survey has indicated this area as one with the richest deposits of Iron Ore, Chrome, Graphite, Coal and Manganese in the country. Mines like Barusuan, Jamda, Kiriburu, Daitari, Tomka, Banaspani, Nuamundi, Talcher,

Rampur etc. are located in the hinterland of this Port. This is the only Port in the country through which Chrome Ore is exported.

The Port is a lagoon type harbour with a turning circle of 520 m. diameter and a draft of 42 feet (12.75 M). The Harbour is well protected by two rubble-mound break-waters. The lagoon is connected to the open sea by an approach channel 1850 metre long and an entrance channel 350 metres long. Of all the completed harbours in the country, Paradip has the deepest draught.

Paradip has one fully mechanised Iron Ore Berth capable of berthing bulk carriers upto 60,000 DWT. Besides, there is also a Mooring Buoy Berth for handling smaller capacity vessels upto 14,000 D.W.T. There are four finger jetties for the purpose of loading. The Iron Ore Berth is attached with a modern Ore Handling Plant with a rated capacity

of 2,500 Tonnes per hour. The Plant includes one mechanical travelling stacker, three crawler mounted bucket wheel reclaimers, one mobile shiploader and a chain of belt conveyor system. With the existing equipment and plants the Port is able to export 3.5 million tonnes of Iron Ore per annum. A general cargo berth with a capacity to handle 25,000 D.W.T. (approx.) cargo vessels is under construction and is likely to be thrown open to traffic towards early 1975. The berth will provide a covered storage space of 150 metres x 40 metres and open stacking area of 116 metres x 40 metres. For repair and maintenance of Harbour Crafts a slipway capable of handling crafts upto 500 D.W.T. is under construction and is nearing completion. The slipway is proposed to be equipped with a modern workshop. The Port can take 7 ships for mooring and alongside berthing when the general cargo berth gets commissioned sometime early in 1975.

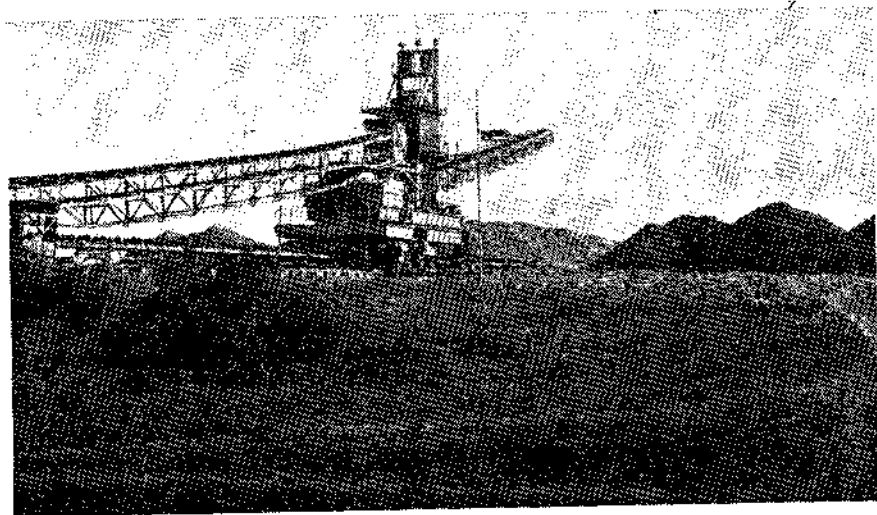
Navigational Aids

Paradip Port is served by a navigational channel of about 1½ nautical miles. This navigational channel is maintained by the Port Dredger that can dredge upto a depth of about 15.3 meters. The navigational channel is marked with international system of channel marking buoys. The navigational channel is also marked with the shore transit beacons. At present temporary lights have been installed on the transit beacons for navigation of dredger and small crafts during night time.

Navigational equipment for night navigation of ships have already been

Shri Mohanty is Secretary, Paradip Port Trust.

Paradip port under construction.



imported. Necessary modification to the transit beacons is being carried out to install navigational lights, which will also be installed on the channel marking buoys.

It is expected that by the end of this year necessary modification of the transit beacons will be completed and the lights installed on the transit beacons and the channel marking buoys. The Port is proposed to be declared open for night navigation anytime now.

The Port Signal Station is equipped with the latest V.H.F. set for communication with the ships approaching, leaving and inside the Harbour.

Facilities at the Port

The Port has two tugs of its own of 1360 B.H.P. and 1350 B.H.P. There are 25 of 100-Ton. barges, two Mooring launches, one Pilot launch, one Survey launch, One Heave-up-cum-Water Barge and a number of other crafts. The Port has also a Trailing Hopper Suction Dredger with a hopper capacity of 1500 M.T. for maintenance dredging operations.

To utilise the sand accreting on the South Break Water to nourish the Northern Shore, a Sand Pump has been installed in this Port. It is a shore based Suction Dredger which moves on a trestle 379 m long and dredges at different points on the trestle. The Pump has a pumping capacity of 8,300 gallons per hour with 20 per cent concentration of solids.

The Cuttack - Paradip rail-link was completed and put into commission in July 1973. The railway network inside the Port area has also been planned and is expected to be completed shortly. The Port railway will have a network of 24 km. length which will facilitate quick movement of traffic into and out of the Port.

Paradip Port has a substantial quantum of sweet water to spare for the ships, as the Taladanda Canal, which takes off from the river Mahanadi and has been extended up to the Paradip Port. It is capable of supplying the entire quantity of water needed for both the township and the ships calling at the Port. Many ships call at the Port for taking their sweet water requirements from the Port for which the requisite facilities exist. The Port has a township, which is growing. It is served by a network of roads with amenities like water supply and electricity.

The Port has its own water works complex having a capacity of 1.5 million gallons per day to supply treated water to the township as well as to the ships. The capacity

can be easily augmented to 3 million gallons per day by providing more filters to meet additional demand, from the several installations of the Port the new developing township as well as to the ships calling at the Port.

Apart from the above facilities, the Meteorological Department of India has also installed a Radar Station having a range of 400 kms. for forecasting weather and cyclones.

The Master Plan of the Port provides for:

- (a) Construction of additional 18 General Cargo Berths to receive vessels of upto 18,000 G.R.T.
- (b) Two additional Iron Ore Berths capable of handling 1,00,000 D.W.T. ore carriers and above.
- (c) Oil dock with two berths to receive 1,00,000 D.W.T. Oil tankers.
- (d) An Ore Handling Plant with its railway net work to handle a throughput of 12 million tonnes per annum.
- (e) Two dry docks, of 130 m x 35m, and 105 m x 18m.
- (f) Modern workshop facilities.
- (g) A full-fledged modern township.

The Fifth Five Year Plan for the Port envisages expansion of the traffic base and strengthening of the Port handling facilities. The main accent in the Plan is on the completion of the spill-over schemes and execution of new productive schemes capable of generating resources for the sustained development of the Port. The Fifth Plan Draft provides for a total outlay of Rs. 50-67 crore including Rs 12.13 crore set off to complete all spill-over works, and Wagon Tipplers for handling iron ore. The new schemes include construction of 2 General Cargo Berths, 2 Ware Houses, expansion of railway facilities for handling coal traffic, construction of dry dock with a capacity to handle vessels upto 60,000 D.W.T. and procurement of additional dredger and other floating crafts, modification to the Ore Handling Plant, modernisation of the workshop facilities, provision of equipment for the newly constructed slipway and other supporting amenities like housing, educational and medical facilities and township development. Provision has also been made for further development of infrastructure facilities like roads, increased power supply etc.

Upto the end of Fourth Plan period the Port mainly exported iron ore and chrome ore. On the average two million tonnes of iron ore was exported annually. Chrome ore exports alone reached 2.5 lakh tonnes in 1973-74. Emphasis has been laid

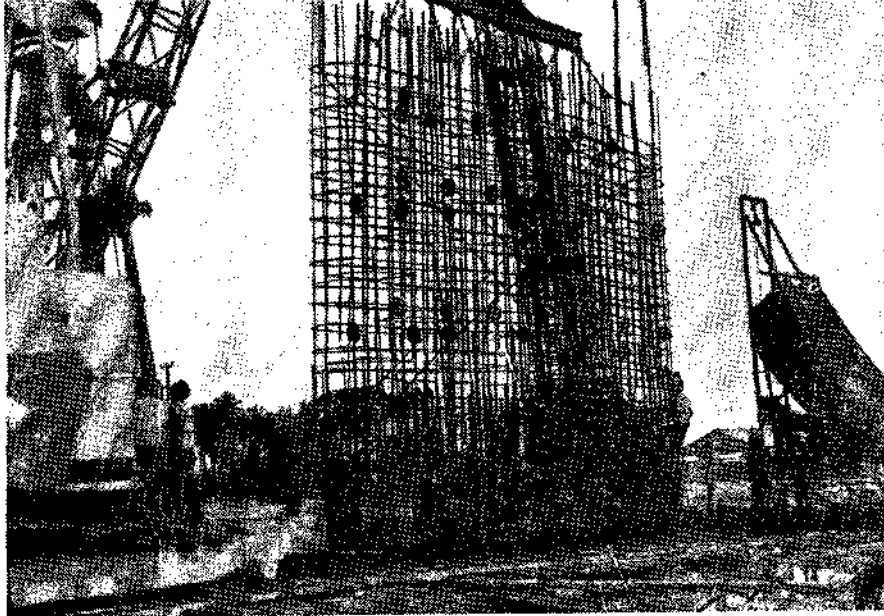
in the Fifth Five Year Plan on diversification of traffic. The iron ore export capability of this Port will increase from the existing 3.5 million tonnes to 4 million tonnes with the proposed modification of the Ore Handling Plant which is being processed by consultants. The possibility of bulk export of coal is being explored. With the commissioning of the General Cargo Berth now under construction, cargoes like kynite, ferro-chrome manganese, iron and steel products, Kendu leaves, Timber, refractories and finished fertilizers etc. are expected to be exported through this Port and cargoes like wheat, fertilizer, rock phosphate, sulphur, murate potash and fuel oil etc. will be imported. The total volume of traffic by the end of the Fifth Plan is expected to cross 5 million tonnes and the necessary Port facilities have been proposed to be provided during the coming five years.

Other Developments

(1) Fishery Harbour Plan and estimate for the construction of a Fishery Harbour at Paradip at a cost of Rs 216 lakh are being considered by the Government. This Project, expected to be completed by 1978, is designed to handle fish traffic varying from 5750 tonnes in the first year to 13,000 tonnes when it is fully developed.

(2) Fertilizer Project & Oil Berth For the proposed Fertilizer Project at Paradip Port the requisite Port facilities are to be created, at a cost of about Rs 900 lakh. It envisages construction of two Fertilizer Berths, one for rock phosphate and sulphur and the other for murate of potash. A separate Oil Berth will also be provided.

The Paradip Port has immense possibilities for expansion inasmuch as deeper draft can be obtained easily because there is no rock in the lower strata. The navigational channel being quite short in length, ships take little time to enter the harbour. There is a vast acreage of unused vacant land around the Port which can be utilised for setting up Port based industries. Skilled and semi-skilled labour are in sufficient supply for manning industries and cargo handling operations. In addition to railway connections, the Port is served by an Express Highway linking the National Highway No 5 and a first class double width black topped road connecting it to Cuttack and to the mining areas of Daitari-Sukinda, Barjamunda, Tomka and Gandharmardan in Cuttack and Deonjhar Districts of Orissa □



Reinforcement cage for the Diaphragm wall

MANGALORE— the new all-weather port



H.K. PANDITARADHYA

THE Port of New Mangalore is now among India's major ports and its opening for limited traffic in June 1974 has been a milestone in the economic development of this region. This has awakened the people here to the industrial potentialities of Mangalore and its hinterland. New industrial complexes such as the Mangalore Chemicals & Fertilizers Ltd. and other industries are being set up in the vicinity and the hinterland of the growing port.

Revival of an Ancient Sea Route

The location of an all-weather deep-sea port at Mangalore has

Tripping Lorry dumps rubble



actually revived one of the ancient sea communication routes between India and the West. The people of this coastal region have all along been highly sea minded, and the Port of Mangalore was an important gateway to the illustrious Vijayanagar Kingdom. In the 15th century, Abdul Razaak, the Persian Ambassador, reached the Vijayanagar Court through this port. In the 18th century, Hyder Ali, the ruler of Mysore, made Mangalore a naval station and established dockyards and an arsenal. His son, Tippu Sultan built the Sultan Battery to prevent the entry of War ships up the Gurpur river.

The Port of Mangalore was for centuries an important outlet for exports to the Middle-east and Far Eastern countries. As the depth of water available at the bar, at the entrance of the existing old port where two rivers join the sea, varies between 2.1 m. and 2.7 m. at low water of spring tide, cargo between the shore and the ships has to be transferred by lighters.

The maximum volume of the traffic handled through the existing minor port is of the order of 6.0 lakh tonnes per annum. During the four months of monsoon, the port is closed to traffic due to rough sea conditions at the entrance to the port.

The New All Weather Port

The development of an all weather Major Port on the stretch of coastline between Mormugao and Cochin ports has been a long felt need and has engaged the attention of the Government of India for a long time. The earlier of the proposals to develop the Port of Mangalore was made by Capt. Lowe in 1837. Later on, a number of operations for the purpose were carried out by successive Governments.

Subsequently, various committees were appointed by Government of India from time to time to develop Mangalore Port as a deep-water major port the important ones among them being (1) the West Coast Major Ports Committee (1948) and (2) the Intermediate Ports Development Committee (1958), appointed by the Government of India. A number of minor and intermediate ports were considered by the committees for development. After a detailed study of the economic engineering, navigation and traffic aspects, Mangalore was recommended by the Intermediate Ports Development Committee for

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major port. Alternative sites were examined and the present location in Panambur, about 9 km north of the existing Port of Mangalore, was finally selected.

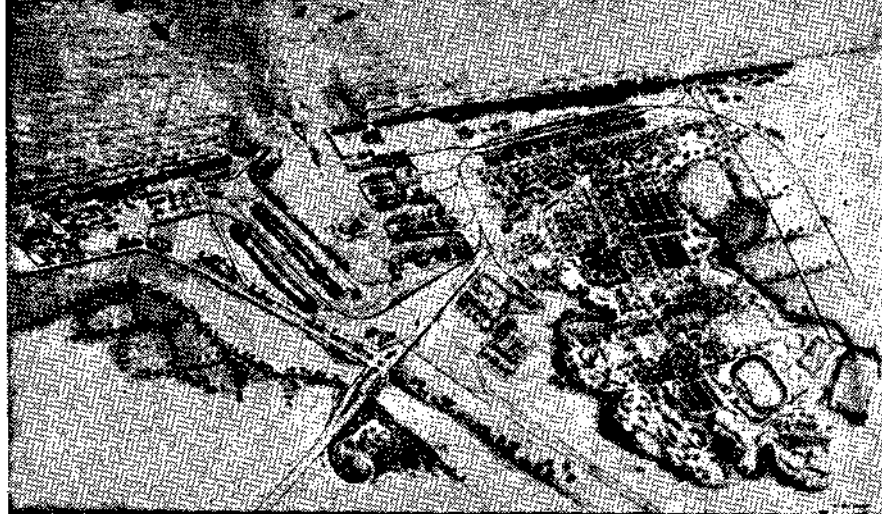
Hinterland and Traffic

After a careful consideration of the inland facilities, existing and planned, and also the location of the major ports of Mormugao, Cochin and Madras, it is estimated that the hinterland of the Port of New Mangalore would consist of the districts of South Kanara, Coorg, Chikmagalur, Shimoga, Hassan, Mysore, Chitradurga, Tumkur, Bellary and Mandya, and portions of North Kanara, Bangalore and Raichur districts. It will also serve the Cannanore district and portion of Calicut district.

The hinterland of the Port of New Mangalore is rich in mineral deposits and forest products. Besides, there are a number of factories in the region producing sugar, paper, cement and steel, electronic goods, tiles and fertilisers. A considerable quantity of sea food products is generated on the coast of Karnataka. Besides, the State has rich cashew-nut plantations and accounts for nearly 80 per cent of the coffee produced in the country.

In addition to the expansion of the existing industries, the region has great potential for a number of new industries. Large deposits of magnetite iron ore have been located at Kudremukh about 50 to 65 km from Mangalore and exploitation of these deposits is being taken up. Export of iron ore from Kudremukh would call for massive improvement in port facilities.

A Government committee which enquired into the regular traffic of the hinterland on a scientific basis submitted its report in 1967. The traffic projections estimated by this committee have been kept under



An artist's view of Mangalore Harbour when completed

constant revision based on the actual industrialisation of the region and changes in the communication system. The following traffic has been estimated through the new port by the Working Group on ports appointed by the Planning Commission for finalising the Fifth Plan proposals of ports development.

Year	1974-75	1975-76	1976-77	1977-78	1978-79
Traffic	7.51	14.52	21.57	21.57	22.94

Communication

Mangalore city is now connected by a broad gauge line to Madras (via) Shoranur. A metre-gauge railway line easily convertible into broad gauge when required, from Mangalore to Hassan is nearing completion. A broad-gauge line from the existing Mangalore station to the harbour site has been already commissioned. The National Highway No. 17 connecting Bombay to Cape Comorin passes by the harbour site. A number of State Highways and other important roads connect Mangalore with the other districts of the State.

Planning the port's Development

The conception, investigation,

Planning and construction of the Mangalore port project have been entirely carried out by Indian Engineers and Experts. Extensive model studies to decide the alignment and other particulars of breakwaters, approach channels, docks etc. have been carried out at the Central Water and Power Research Station, Poona.

The development of the port is proposed in stages so as to cater to the increasing traffic requirements and to distribute the capital investment. A tentative master plan to include provision for additional docks, ship repair facilities, storage sheds etc., with a maximum draft of 50 feet (15.25 m.) to receive ships up to 1,00,000 DWT has been prepared. The master plan has been kept under constant review in order to suit the latest developments in cargo handling and navigation. The revised layout plan provides different locations for bulk and other general cargo handling facilities and admits future development in a very compact way. A 30 feet draft dock with necessary turning basin and approach channel are provided in the first stage of the port development scheme.

The first phase of the scheme was approved by the Government for Rs 2430 lakh and an expenditure sanction was accorded for Rs 2190 lakh. The provision of an additional alongside berth at an estimated cost of Rs 240 lakh to be constructed later, which will cater to the increased traffic has also been made in the approved scheme.

Construction of the first phase has been complete and the port was opened for regular traffic by the Prime Minister early this month. □

A View of the finished breakwaters



With a rich hinterland of about 41,000 square kilometres and a good network of roads and railway lines, the Port of New Tuticorin is coming up against an ancient background of maritime history to fulfil the needs of an emerging modern economy. Sheltered as it is from cyclones and practically free of high tidal waves, it is ideally situated to take on the burdens of a major gateway of commerce in South India.

TUTICORIN

The New Born Major Port

D. I. PAUL

**Our
Major
Ports**

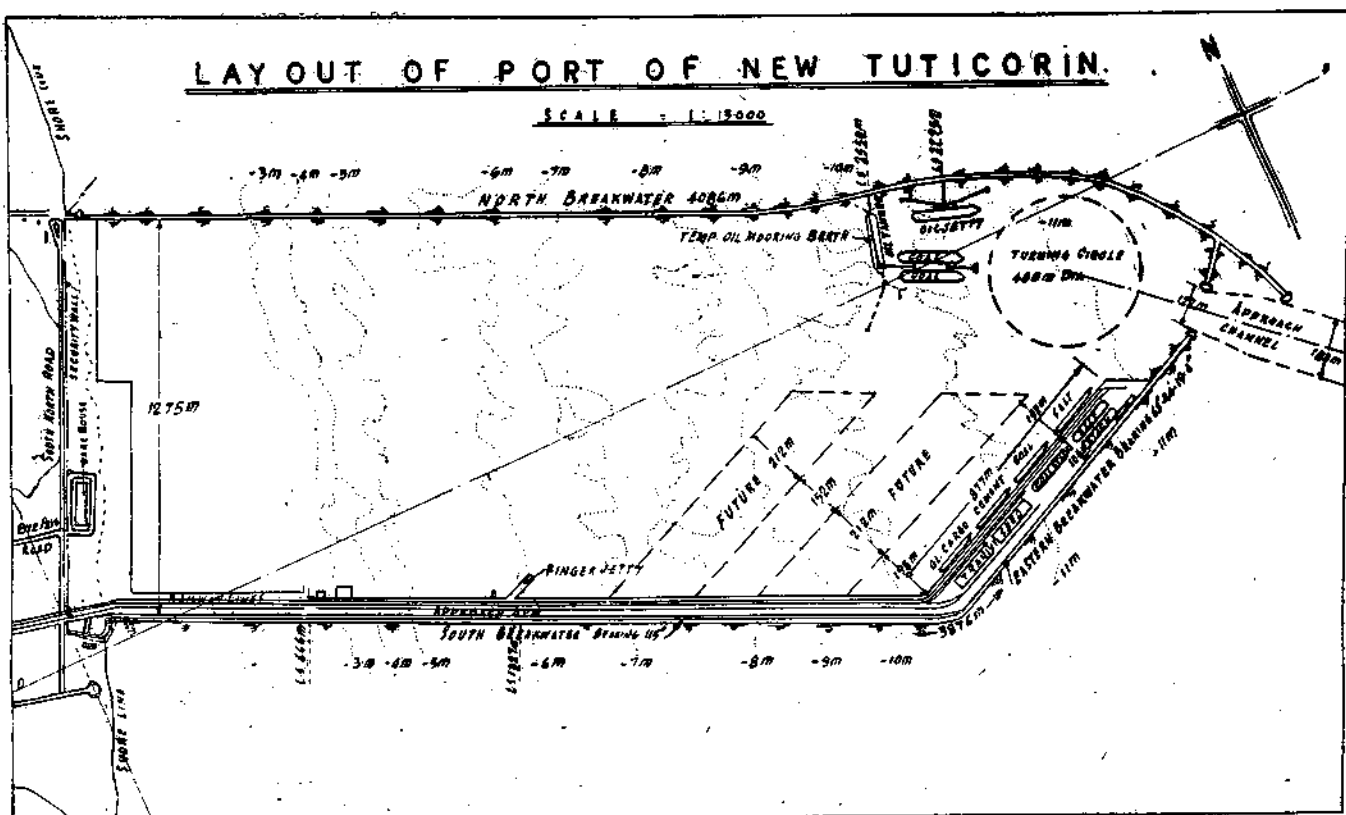
THE history of the existing Tuticorin Port goes as far back as to A.D. 123. Ptolemy of Greece described Tuticorin as a flourishing centre of maritime trade with western and eastern countries. The Port was in existence from the times of the Pandyan Kings. The decay and fall of the ancient ports of Korkai and Kayal due to silting with sand deposition from the Thamraparni River gave Tuticorin a position of importance even in those days. Maritime trade expanded in Tuticorin Port during the reign of the East India Company. The rebirth of Tuticorin as a port of major importance is a matter of recent history, arising largely from the increase in cotton trade in this region.

Tuticorin is ideally located, sheltered as it is from cyclones by Sri Lanka in the east and Adams Strait in the north-east. It faces a calm and tranquil sea with a tidal range of one metre. The first pier of the Tuticorin Port was constructed in the year 1863 and today the existing port of Tuticorin is the largest Intermediate Port in India handling over one million tonnes of cargo per annum. However, the port is an open roadstead situated 9 km off-shore to the east of Hare Island in deeper waters and the cargo is handled by lighters plying between

Shri Paul is Chief Engineer & Administrator, Tuticorin Port.

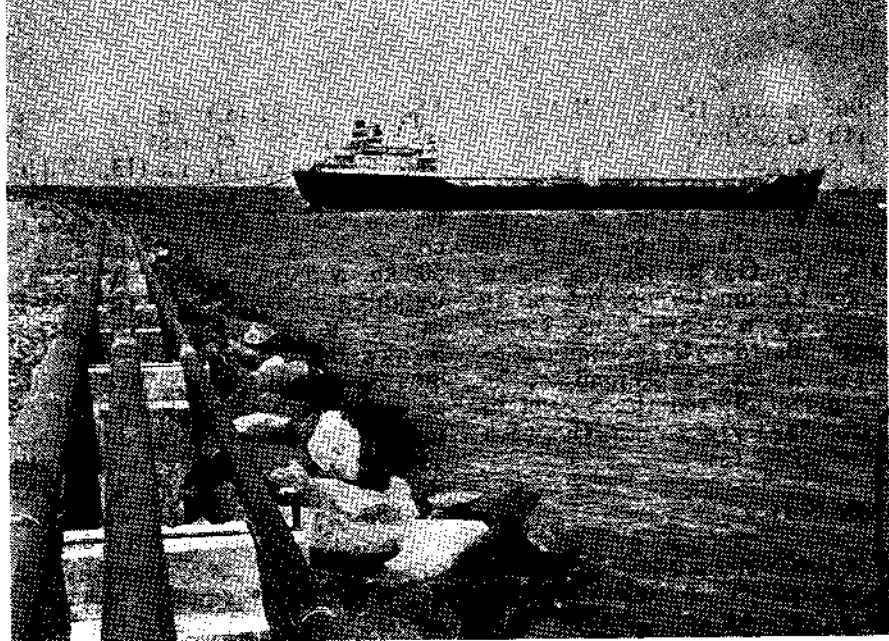
LAY OUT OF PORT OF NEW TUTICORIN.

SCALE = 1:15000



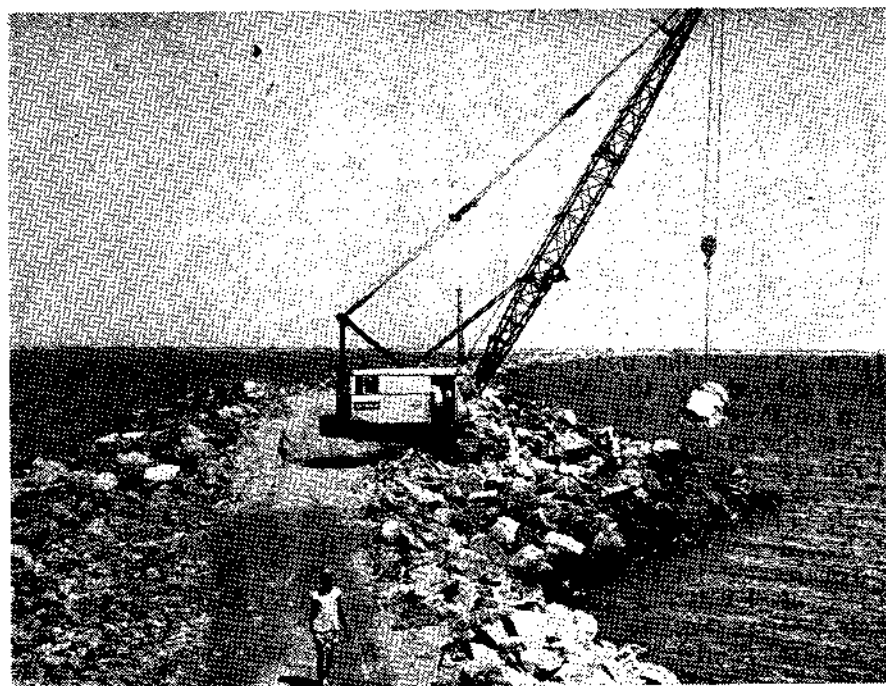
ship and shore which involves wastage of time and material. Hence the need to develop the port into a major harbour with alongside facilities was felt a long time ago as an important step for the economic upliftment of the region.

The idea of developing this Minor Port into a major harbour with alongside facilities was conceived as early as 1920. On the instructions of the Government of Madras, Sir Wolfe Barry Lyster and partners investigated the prospects of the development of the port and reported to the Government that Tuticorin had great possibilities arising from the physical advantages of its location and future trade prospects. Based on their recommendations, Sir Robert Bristow was appointed as Harbour Engineer to prepare detailed estimates and plans. In 1922, Sir Bristow formulated a new proposal called the Bristow Scheme to construct the harbour off the Hare Island. Later, the Government of Madras appointed an Expert Committee, known as the Palmer Committee to examine the project of Sir Robert Bristow and they suggested construction of the harbour at the inner end of the present fore-shore after reclaiming 200 acres. In 1929, the Tuticorin Port Trust decided to implement the Palmer Committee Scheme, but the Government was not prepared to provide money. In 1954, the Government of India appointed Shri Chatterjee to carry out investigations for developing Tuticorin into a 20 ft. draft harbour and this scheme, too, estimated to cost Rs 4.5 crore, was not taken up. In 1955, the development was referred to the Sethusamudram Canal Project Committee under the chairmanship of Sir A. Ramaswamy Mudaliar and this Committee too urged the implementation of the project. In 1958, the Government of India constituted the Intermediate Ports Development Committee and this Committee, after reviewing the various schemes, submitted its report in 1960 recommending the development of Tuticorin into a Deep-Sea Harbour. The Government of India accepted the recommendations of the Intermediate Ports Development Committee and decided to construct a Deep-Sea Harbour off Hare Island, 9 kilometres south-east of the existing Minor Port, which was found to be the ideal location for the construction of harbour with minimum cost. The Government of India sanctioned a preliminary project scheme in 1963 and allotted Rs Five crore in the Third Five Year Plan for the purpose. Various shore works and offshore works were carried out

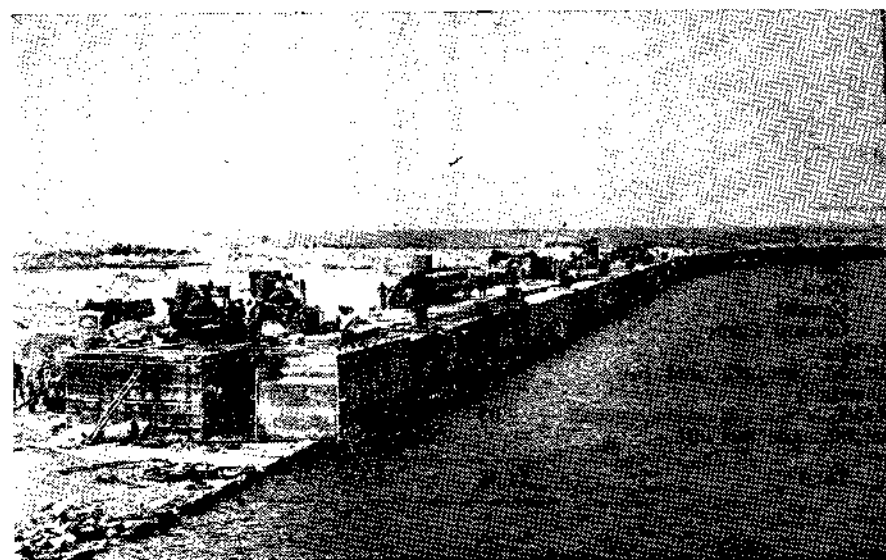


A view of an Oil Tanker in Mooring Berth.

Construction of the North Breakwater.



Wharf Wall being built. Concrete capping in progress.



till 1966 on annual budget allotments from the Government through piece-meal contracts. Towards the end of 1966, a doubt was raised about the financial viability of the new port as the quantum of traffic estimated was small. The Government appointed an Expert Committee again to study in detail the pros and cons of the scheme. Based on the recommendations of the Expert Committee, the Government cleared the project in 1968 for Rs 24.40 crore and the work is now in progress.

Traffic Survey

For the economic justification of any port project, a realistic traffic survey is a pre-condition. The first systematic traffic survey for Tuticorin was carried out by the National Council of Applied Economic Research during the year 1958-59. During 1967, the Government appointed an Expert Committee to go into the details of the traffic potentialities of the hinterland of Tuticorin. This Committee projected a traffic of 22.35 lakh tonnes in 1971-72, 35.10 lakh tonnes by 1975-76 and 44.20 lakh tonnes by 1980-81. As these two studies mentioned earlier had been made a long time ago and as there have been industrial developments in the hinterland of Tuticorin which were not foreseen at the time, the traffic figures were again analysed by the Working Group on Ports about the end of 1972, and the final assessments made by them were revealing:

The investigation, planning and designing of the Tuticorin Harbour have been done by Indian engineers based on the model studies conducted at the Central Water & Power Research Station, Poona. The Port will be an artificial deep-sea harbour with rubble mound type parallel breakwaters, north and south, including the eastern arm with a length of 4086 m. and 3876 m. respectively, 275 apart and projecting into the sea with an entrance of 122 m. width enclosing an area of 960 acres of sea. At the moment, the North Breakwater at Tuticorin will be the longest breakwater in the world extending to

13,407 ft. (4,086 m.) and next comes the breakwater section at the port of Long Beach in California (13,350 ft.). The rubble-mound type breakwaters are being constructed with core zone of stones weighing 10-500 kg. wrapped with armour stones weighing anything between one to over eight tonnes. At the end of breakwaters, semi-circular type of pier heads will be provided. The marine terminals proposed will be in the form of an alongside wharf adjoining the eastern arm of South Breakwater to cater to 4 berths located in the natural deeper waters at a distance of about 3,000 m. from the shore and the connection between the wharf and the shore is by means of road and railway links laid over the reclaimed approach arm with a width of 61 m. adjoining South Breakwater. The wharf wall is of slice work design and will be formed with precast cement concrete blocks of various sizes, each weighing between 15.4 mt to 26.50 mt founded on rubble levelling course. The transit sheds and stacking areas for coal and salt will be provided in the wharf itself. In the initial stage, the Harbour will cater to 30 ft. draft ships, in all the four alongside berths. The foundation of the wharf wall for the end two berths for Salt and Coal will be taken deeper to accommodate two 35 ft. draft vessels when traffic demands rise in the future.

Facilities Envisaged in the First Stage

- (a) Berths: 4 Nos. for salt, coal, cement and general cargo. Draft: 30 ft.
- (b) Storage Facilities:
Transit sheds two of size 150m. x 36m.
Warehouse: one of size 150m. x 36m.
- (c) Port handling equipments:
(i) 3-T Wharf cranes 3 Nos.
(ii) 3/T10-T Wharf Crane 1 No.
(iii) 6-T Wharf cranes 2 Nos.
(iv) 4-T (net) Grab cranes 4 Nos.
(v) 3-T Diesel Forklift Trucks 12 Nos.

F in lakh tonnes

Commodity	1975-76	1976-77	1977-78	1978-79
Salt	3.95	4.20	4.50	4.70
Coal	6.00	6.00	6.00	18.00
Cement	4.50	4.50	6.00	6.00
General Cargo	4.35	4.35	7.10	7.10
Fertilizer	1.50	1.96	2.26	2.37
(finished products and raw materials)				
P.O.L.	4.08	4.85	4.85	4.85
(naphtha and fuel oil)				
Total	24.38	25.86	30.65	43.02

- (d) Flotilla:
Harbour tugs (15-T Bollard Pull) 2 Nos.
Pilot launch 1 No.
Mooring Boats 2 Nos.

In addition to the above, one Survey Launch, Inspection Launch, Tug (5-T Bollard Pull), Floating Crane 10-T/15 metres radius, 3 Nos. Steel Dumb Barges acquired during construction stage will also be available.

All shore works, such as laying of road and railway approaches, communication lines, construction of staff quarters and temporary office buildings, provision of water supply, electricity, sewerage and drainage of facilities etc. have been completed in all respects. The South Breakwater has more or less been completed except the construction of pier head. The major portion of work on the North Breakwater has been completed and more than one third of the wharf wall has come up.

The reclamation of approach arm adjoining South Breakwater has been completed and further work in the wharf area is in progress. The dredging of sand and other loose material along the approach channel was carried out by the Dutch Dredger 'Poseidon' and patches of rocks have to be removed, to deepen the approach channel to 10.98 m.

One mooring berth for berthing tankers of 500 ft. to 600 ft. length was provided and commissioned in July 1974 by berthing the first tanker. At the present rate of progress in construction work it is expected that the first alongside berth will be ready by the end of 1974 and the remaining berths by 1975.

The Fifth Plan Scheme for Tuticorin Port includes the construction of one permanent Oil Jetty, two Coal Berths and acquisition of one 15-T Bollard Pull Tug. The proposal for two Coal Berths is to cater to the coal requirements of the proposed Thermal power Station at Tuticorin to the extent of 1.35 to 4.60 million tonnes based on the request of the Tamil Nadu Electricity Board. The estimated cost of the two coal berths is Rs. 300 lakh. The additional Harbour Tug required will cost about Rs. 60 lakhs and this will handle the oil tankers and colliers.

Tuticorin has a rich hinterland comprising the districts of Madurai, Kanyakumari, Ramanathapuram, Tirunelveli and the Southern Taluks of Tiruchirappalli, totalling 16,000 sq. miles. The port is well connected by roads, radiating to all the important places and railway lines in these four districts.

Men Who

Toil in Our Ports

AVINASH GODBOLE

Our Bombay Correspondent

THE story of Indian ports would not be complete without reference to the 2,00,000 port and dock workers who toil at these places, braving heat and rains. Fifty percent of these workers are engaged in the nation's two major ports alone—Calcutta and Bombay.

It is a common belief that the terms 'port workers' and 'dock workers' are synonymous and that they belong to a common authority. In reality, however, both these categories have distinctive areas of activity. A dock worker is a person engaged in the loading and unloading of ships. According to the definition in the Dock Workers (Regulation of Employment) Act, 1948, he is "a person employed or to be employed in or in the vicinity of any port on work, in connection with the loading, unloading, movement or storage of cargoes, or work in connection with the preparation of ships or other vessels for the receipt or discharge of cargoes or leaving ports." This definition is wide enough and covers all employees of the port trusts, the stevedoring workers, and all those employed by shipping companies, clearing agents and other private employees whose business brings them into regular contact with the ports. In actual practice, however, the common definition is applied to dock workers and port trust employees are categorised as port workers.

Legislative Measures

If the living and employment conditions of these workers are better today, it is due to the various legislative measures taken by the government.

Loading and unloading of cargo from the ships to the wharf and from the wharf to the ships and chipping and painting work of the ships are the jobs done by dock workers. Handling of cargo from the moment it reaches the wharf and leaves the dock gates and maintenance of ports and its approaches are looked after by the port trust employees. These workers fall into two broad categories: those handling cargoes and those engaged in other services. The port workers are under the respective port trusts while the dock workers are under the care of Dock Labour Boards (DLB) set up at the different ports

under the Act of 1948 mentioned earlier. In Bombay, there are about 30,000 port workers and 20,000 dock workers out of which 10,000 are registered with the DLB.

While other ports have drawn their labour force from their own hinterland, Bombay docks have attracted many of their workers from areas far beyond. The result is that the work force is cosmopolitan in character; representing different ethnic and language groups.

According to the study made by Dr. S.D. Punekar and P. Ramachandran in 1962 (Survey of Labour Mobility in Bombay Tata Institute of Social Sciences) 55.76 p.c. of the port and dock workers had their origin in Uttar Pradesh and only 15.76 p.c. were from Maharashtra. The composition must have changed now but still the percentage of those from U.P. is more.

Till the advent of freedom in 1947 there was hardly any system governing the service conditions of dock workers in Bombay. While the Bombay Port Trust had their administrative and other staff on a regular basis, its shore workers handling cargo were taken according to the exigencies of work. It was given to *toliwallas*, *serangs*, *tindals* and other middlemen (who worked as jobbers or labour contractors) to engage workers on casual basis, whenever there was a demand. It was a similar state of affairs in the case of dock workers too. Here, the stevedores and shipping companies took the help of these middlemen for securing labour. There was hardly any fixed rate of pay for hours of duty. These middlemen being generally muslims from U.P. and the Gangetic Plains and from NWFP (now in Pakistan), the large

majority of these workers used to be (and still are) muslims. The loaders and the foodgrains workers have been traditionally from Satara dist. in Maharashtra.

This system or rather absence of system of employment led to crying abuses. These middlemen attracted men from their villages for work in the city. They even advanced money and when once they were in the town they acted as their money lenders. This state of affairs continued till the Government initiated the decasualization scheme in 1948. Till then all these workers used to wait at the dock gates in the expectation of being chosen by the gang leaders. Those who obtained two or three bookings one after another, did so because they bribed the *tindals*. ('Dock Labourers in Bombay and Calcutta' by R.P. Cholia.)

Living and working conditions of the workers before decasualization were marked by exploitation and abuses typical of a labour force that has to depend entirely on casual work. The situation has undergone a big change in the last 30 years. While the Bombay Port Trust has made most of its shore establishment on regular basis, the dock workers have been decasualised under the Dock Workers (Regulation of Employment) Act of 1948. Under this act, the working force at different ports, has been brought on a regular register and the task of assigning work to the workers is being done by statutory dock labour boards. The Bombay Dock Labour Board was set up in 1951.

The Labour Board

The Labour Board is a tripartite body representing Central Government, employers of dock workers and established companies and dock workers. It maintains a register of workers who are on permanent basis and assigns work to them strictly by rotation as per the demands of the stevedores according to requirements. The workers are paid their wages direct by the Board. For this purpose, the Board charges a fee and for every 100 rupees so charged to contractors or stevedores, it collects a levy which at present is Rs 115/-. With the amount thus collected the Board meets the expenditure such as on wages, adminis-

trative expenses, welfare activities etc. A minimum wage is also guaranteed, work or no work.

The emoluments and service conditions of the dock workers have improved in the past 25 years mostly as a result of the Board's efforts. In 1972-73, the average earnings per worker were Rs 470.62 per month in the case of stevedore workers and Rs 309.62 in the case of foodgrain workers. The chipping and painting workers however earned Rs 242.09. These emoluments are better than those of dock workers in other ports. This is also perhaps due to the fact that the productivity of the Bombay dock workers is comparatively higher than those of their counterparts in other ports.

Better Amenities

Not only has there been improvement in the monthly earnings of the workers but their living conditions also have undergone a great change. Thirty years ago many of them had to live on footpaths or in huddled conditions with their relatives or friends. Today at least 25 per cent of the eligible dock workers have been provided with tenements by the Bombay Dock Labour Board. Besides, with security of service, they can afford to live better. The workers are also covered by provident fund, gratuity and medical help, and leave travel concession. In the past four years, they have also been getting bonus.

Shore staff of the Bombay Port Trust workers, who were earlier on a casual basis like dock workers were brought under regular roll. Due to the efforts of their trade unions, they had also been beneficiaries of various facilities available to their colleagues in the regular establishment.

As workers in other fields, the port and dock workers had also to struggle for their demands. It must be said to the credit of the dock workers' trade unions that they have avoided an extremist stance and displayed understanding. They have not merely agitated for better service conditions but have also tried to make their members good citizens. The enlightened employers operating in the Bombay docks have also been alive to the spirit of changing times and though there have been strikes they were never allowed to take a serious turn.

The first union to be started in Bombay docks was the Bombay Port Trust Staff Union in 1926. The pioneers of this union were

Shri F.L. Ginwala, a solicitor and Shri N.M. Joshi, later to become the 'father of Indian trade unionism' and Shri S.H. Jhabwala. The next was the Bombay Dock Workers Union which started amongst the stevedoring workers in November 1931. It was this union which served notice on the BPT and Bombay Stevedores' Association on November 1, 1947, demanding the abolition of Toliwala system of employing shore workers and its replacement by direct mode of employment. The strike was successful and an agreement was reached abolishing the system and it was the beginning of the days of regular employment among the shore workers of the port trust and the dock workers. Dock workers were ultimately brought under control with the establishment of the Bombay Dock Labour Board in 1951.

Though there are more than a dozen trade unions carrying on their activities amongst the port and dock workers in Bombay port, the biggest has been Transport & Dock Workers' Union (TDWU) which came into existence with the merger of five unions in 1954. Today, about 50 p.c. of the port and dock workers owe allegiance to it. It is affiliated to the All India Port & Dock Workers' Federation which in turn embraces about 70 p.c. of the organised port and dock labour in the country.

The TDWU was pioneer in starting a cooperative credit society by a trade union in Bombay in 1952 (when it was known as Bombay Port & Dock Workers' Union) to cater to the needs of its members. This society does not merely give credit facilities but also supplies consumer goods to its members and engages them in other social activities with an intention to guide and help them to raise their standard of living. It has also assisted in promoting cooperative housing societies of dock workers and by now over 750 tenements have been built by the cooperative formed under the guidance of the union. This and other unions also run consumers' societies and canteens in port trust and dock workers' colonies.

The peculiarity of these trade unions has been that though their leaders belong to different political parties, or affiliated to national labour organisations, they have fought their battles on their own strength. Many a time, they have refused to toe the line of the political parties and have taken inde-

pendent decisions. The unions have also encouraged their workers to attend classes of the Central Board of Workers' Education and over 60 to 70 workers have become worker-teachers under the scheme, and have been taking interest in the union activities.

Need for Training

What is the impact of workers' education on the attitude of the workers? According to an official of the Bombay Labour Board, this training has imparted a sense of responsibility and moderation amongst the workers who have undergone it. On the contrary, according to a spokesman of the dock workers' union, this training has blunted the sharp, agitational approach of the workers. He however agreed that there was need for training amongst the workers about the trade union movement and their activities, but under the present conditions when the scheme is being implemented by the Government statutory board, there is bound to be a sort of moderating influence on the minds of the workers. Had the unions taken upon this work it would have been a different story?

Asked to comment on the Government's approach towards trade unions, he said that the Government should become more responsive than what it is now. It so happens that by the time the Government accedes to a certain demand of the union, the situation gets so changed that the acceptance is of little value and the unions have to take up cudgels with the Government on behalf of the workers.

The question of revision of pay scales and working conditions is always under review and on December 12 last, the Government constituted a Wage Revision Committee of dock workers under the chairmanship of Shri B.N. Lokur, former Secretary to the Ministry of Law with Dr B.B. Mehta, Professor and Head of the Department of Economics, South Gujarat University, Surat and Shri T.S. Sankaran, Joint Secretary, Ministry of Labour as members. The Secretary of the TDW union and the chairman of the All India Port & Dock Workers' Federation Shri S.R. Kulkarni has however observed that this committee would be of little avail and that it would be better if the unions were allowed to settle their disputes by bi-lateral negotiations with the respective port authorities. □

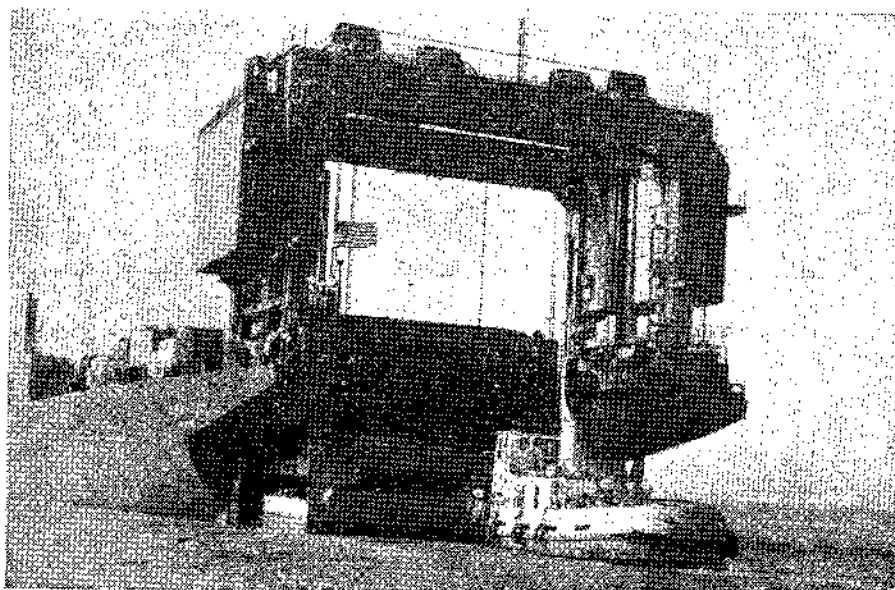
The LASH Concept Can Save Costly Investment

R. ROY

If we are prepared to take advantage of technology which has already been proved and jump many in-between steps, we can handle the traffic projected for 1985-86 and much more without spending anything more on port facilities

THE concept that makes this remarkable difference possible has been given the name "LASH" which stands for—*Lighter Aboard Ship*. The first of this new generation of revolutionary ships is already plying between the United States and Europe and the rate at which orders are being placed on shipyards every day for more ships of this type is comparable only to what happened a few years ago when containerisation became a world-wide phenomenon.

The motivation that led Jerome Goldman to invent LASH is basically the same that led Malcolm Mclean to develop containerisation. In both cases the motivation was the urgent need to reduce the time that a ship had to spend in port and to cut down the prohibitive cost of cargo handling at the ports. In spite of claims to the contrary it is not factually correct to claim that handling cargo in a port or inside a ship is much more difficult or hazardous than handling the same cargo in a warehouse or in and out of a host of other transport vehicles. The reason why port labour throughout the world are perhaps the most expensive is because they confront the most expensive bargaining factor—a ship in the port. A ship (like any other mode of transport) makes money only when it is on the high seas and is losing money all the time when it is in a port. Port labour have always known this elementary fact and have always taken advantage of it. Conventional ships work-



The LASH Ship, 'S. S. Robert E. Lee', at Kandla

ing in the conventional cargo handling methods, spent over 60 per cent of their time in ports and as the costs went up, not only of the ships themselves but of the fuel and the staff required to run them, it became evident that the days of sea transport as a viable means of international exchange of goods were numbered if the port-time of ships could not be drastically reduced.

Containerisation was born out of this motivation and its success is attributable to the fantastic saving in the port-time of ships which it made possible. The LASH concept achieves the same objective but has many facets which are of

particular interest to developing countries where port facilities are inadequate and money is an important constraint.

In a normal general cargo ship there are several hatches and each batch has two or three decks or compartments. Cargo for different ports on the ships regular run are loaded in different batches or decks all of which are integral parts of the ships' construction. The ship itself, therefore, has to go alongside an expensive berth and stay in the port till the, say 600/700 tonnes of cargo meant for the port, is taken out and perhaps another 600/700 tonnes loaded. All this may take 2 or 3 days during which a very

expensive ship is detained in port, causing loss of money. In the LASH concept the 'parts' of the ship carrying the cargo meant for a particular port is bodily detached and set afloat and replaced by similar 'parts' already loaded which were left behind in the last voyage. The whole process of 700 tonnes 'out' and 700 tonnes 'in' would need the mother ship to be detained for only one hour at or near the port. This is achieved by the mother ship being built with detachable holds which can be bodily lifted out and set afloat in the form of uniform size barges. The mother ship does not have to enter the port at all and can either lie out at sea or, in a riverine port come up the estuary as far as drafts would permit and then set its "import" barges meant for the port concerned afloat and carry on its voyage. Whilst the ship is away, the barges, the largest of which require only 8' to 9' of draft, are towed to any normal barge loading facility where the import cargo is unloaded, export cargo loaded and the barges are then towed back for the mother ship to pick up on its return trip.

Ocean trade can thus be carried out without a conventional and expensive port. 8' to 9' of water is no problem along the coast of any country and most rivers can take such barges hundreds of miles inland to cut down the final overland distances.

Nowhere in India does the LASH Concept have such a great future as the hinterland which is served by the Port of Calcutta. The estuary of the river has sufficient depths to cater to the largest foreseeable LASH ships and with the opening of the Farraka canal, LASH barges can be towed to inland destination in the heart of the country. In the industrial belt of greater Calcutta, efficient barge loading facilities are available at hundreds of places over the stretch of about 80 miles of river on either side of the present port. Today, these barge facilities serve only the limited purpose of loading a barge which serves as an inland navigational vessel, to bring the cargo alongside for loading into ships. Tomorrow, each of these facilities would be able to load the ship itself as it were. The extensive Inland Vessels Wharves of the port which served the Assam-Bengal river trade and have been largely idle since 1965 would once again regain their former humming activity, only much more so.

In tropical countries like India there is always serious disruption

to work during the rainy months when loading and unloading operations on ships have to be held up not only during periods of actual rain but whenever rain is threatening. This disruption accounts for serious ship detentions and cases are not rare where some shipping lines either reduce the number of sailings or totally avoid sailings during the monsoons. Ports and Shipping companies thus affected have for years been experimenting with different types of rain coverings which would enable cargo working during showers but none of these have been of much practical use in the type of rain that lashes the shores of India and most other countries during the monsoons.

The LASH system has overcome this great problem because it is easy to provide a completely covered loading berth for barges. Since the largest of the barges so far is only 31' wide, what is being done in ports like New Orleans in the United States is to provide 70'

wide shallow draft covered slipways with a length of about 150' ft., into which four such barges could be accommodated at any one time. The slipway area is served by 15-Ton E.O.T. cranes which also span about 30' of land-width on either side of the slipway. This "transitshed" for LASH barges is of the same height as most normal singlestoried transit sheds at conventional shipping berths and are comparatively inexpensive facilities for the returns they give.

Whatever may be said about the utility of this particular system for India's international trade, there is no doubt whatsoever that the system is tailor-made for India's coastal shipping trade. The coast of India is dotted with over 200 ports of which only 8 are what we call major ports, where regular sea-borne trade is carried out. LASH is a concept which could easily make a large number of these 200 ports into centres of sea-borne traffic with little if any further investments.

Factors Controlling Export Trade

PAUL JOSE

THE achievement of ambitious export targets depends on many factors. Our exports have to be competitive in International Markets so as to register such a substantial rise. Promotional freight rates and exploration of new Export markets in foreign countries also have to be made. The development of Indian shipping would have a direct impact on promoting our exports to new markets and also to traditional markets by providing frequent and economical sailings and offering concessional freight rates. Our immediate and overwhelming problem is how to increase our exports of as many items of our manufacture as possible and to as many overseas markets as possible. Every facet of our industry has to make a positive contribution towards this goal. The contributions that India's Major Ports have to make in the storage, handling and shipment of our Export cargoes would therefore be of paramount importance. The role of the Major Port of Cochin is prominent in this respect since she handles very important items of foreign exports

which fetch the much needed foreign exchange to our country.

New Concepts in Cargo Handling

The cost of cargo handling forms a fairly high percentage of liner freight rates particularly in trades with industrially developed countries where cargo handling is being carried out by mechanical aids. Thus the new concepts in the field of cargo handling are aimed at reducing the cost of handling, handling of cargo in bigger unit loads, elimination of damage and pilferage in cargo handling. The popular new techniques in cargo handling in the world's Major Ports are 'palletisation' and 'containerisation'. The salient features of this change in the field of cargo handling are to avoid damage to cargo and to achieve maximum operational efficiency in cargo handling techniques by transforming the nature of cargo into unitised and containerised loads, leading to higher output in loading/unloading operations, thereby enabling quicker turn round of ships at the Port. In this context it would be interesting to know the progress achieved at this Port in experimenting with the new techniques of 'palletisation' and 'containerisation'.

Shri Jose is Deputy Traffic Manager, Cochin Port Trust.

INDIA CANNOT AFFORD TO FALL OUT OF STEP

RALPH J. WATKINS

I. What Is this Revolution?

I. It is the discovery and the implementation of the principle of the unitized load, that is, the bunching of cargo together to reduce the number of handlings; and the mechanized handling of these unitized loads.

II. How is this Unitizing Done?

1. By pre-slinging

Bundling appropriate cargo together, attaching a nylon or steel or other type of sling around the bundle so it can be lifted easily into the hold of the ship. And leaving the sling in place for easy unloading by the simple device of attaching the sling to the ship's hook.

2. By Palletization

- Stacking crates, cases, or bags of cargo on a platform or pallet of wood or metal, measuring around 4 by 6 feet or 6 by 6 feet or so.
- And lifting the pallet by fork-lift truck and moving it to dockside to be lifted on board; and moved by fork-lift truck within the ship.

3. By containerization

Stuffing cargo into standard containers, measuring 8 feet wide by 8 feet high by 30, 30, or 40 feet in length, which can be lifted by cranes on to truck chassis, railroad flat cars, barges, container ships, or large cargo airplanes.

4. LASH ships (acronymic: "Lighters aboard ship"), another form of unitization.

5. Roll on, roll off of truck trailers or trucks, side or end doors to ships, still another form of unitization (RORO)

III. What is accomplished by this unitization and mechanization?

- Cost per ton of cargo is sharply reduced.
- Time required for loading and unloading is dramatically reduced, thereby reducing the ship's unproductive time in port and increasing available sailing time.
- Containerization, the real essence of unitization, also makes

possible: (a) Door to door multimodal movement of goods by truck, by flat car, by barge, by container ship, or even by large airplanes; (b) eliminates damage from the elements and reduces breakage; (c) eliminates pilferage.

4. In short, unitization and mechanization, especially in its ideal form, containerization, constitutes a profound technological revolution in maritime commerce, which is now sweeping the world.

IV. How did revolution get started?

1. Basically, it is a response to the high and rising cost of handling cargo, especially in U.S. ports. Stevedoring costs in American ports are 10 times as high per ton as in India; 6 times as high in Europe as in India.

2. The basic ideas behind this technological revolution are very simple. Slings are traditional in loading ships, and it only remained for someone, spurred by the high cost of unloading in U.S., Canada, Japan, Australia, and Western Europe, to ask: Why not leave the sling around the bundle in the ship's hold in order that the sling could be quickly attached to the ship's hook at destination and easily lifted from the ship's hold to the dock?

3. Fork-lift trucks have long been used in materials handling, especially of heavy crates or boxes, in the high-labour-cost economies of North America, Western Europe, Japan, and Australia. Again, it only remained for some "smart cookie" to ask, why not make a simple platform or pallet on which cases and bags and crates could be stacked and the entire pallet lifted and moved by fork-lift truck? And someone else to ask: Why not put fork-lift trucks on board ship to lift and move pallets within the hold of the ship, deck by deck?

4. The origins of containerization were equally simple. Malcolm McLean had built up a major trucking business along the U.S. East Coast, using large 10 and 20-ton trailers pulled by powerful stub-nosed trucks. About 15 years ago he developed a considerable volume of trucking business between New York and Puerto Rico, an island in the

Caribbean Sea, and between New York and U.S. Atlantic and Gulf of Mexico ports. At first entire trailers were lifted or rolled on board ship. This was the origin of Sea-Land services. Then Malcolm McLean, who probably knew nothing about ocean shipping, asked another simple question. Why can't somebody build me a box or container that could be lifted off the trailer chassis and deposited on board ship? Why pay freight on these heavy wheels and chassis?

And somebody did build that container, and a thriving container business was developed, N.Y. to Puerto Rico and U.S. Atlantic and Gulf ports; and from East Coast to West Coast via the Panama Canal; and Matson Lines quickly got into the action, starting container service between the U.S. West Coast and Hawaii, beginning about 1958.

These container services were all within U.S. domestic trade. Sea-Land Seavices, Matson Lines, and others could equip their installations at both ends to handle the containers. Strangely enough, European ports and shipping lines were slow to observe the enormous advantages of containerization, and it was only after about a decade of successful operations in U.S. domestic shipping routes that containerization was initiated in the North Atlantic trades. Within a span of about 3-4 years, however, progress has been so rapid that more than half of general cargo moving on the North Atlantic routes now moves in container ships; and practically all general cargo in those North Atlantic trades will so move within a few years.

V. What does a container port look like?

Wide open docks generally, with one or more gantry cranes for lifting the 10 to 20-ton or more containers from the ship's deck or hold and depositing them on the dock in an operation that takes not more than 2 or 3 minutes. On the dock the container is either placed on trailer chassis which is quickly removed to the container park by stub-nosed trucks; or it is picked up by a container transporter or by straddle carrier truck which then moves it to the adjoining container park, the straddle carrier being able to stack them 2 or 3 high.

The containers have now been standardized through the International Standards Association, measuring 8' wide, 8' high, and 20, 30, or 40' long—usually either 20 or 40'. A full container ship w

Shri Watkins was on the staff of the Ford Foundation, New Delhi.

carry from 600 to 1200 or more containers, and with two or more gantry cranes can be unloaded and reloaded within about 24 hours, minimizing time in port and maximizing sailing time.

Many containers are refrigerated for transporting perishables, and the container park must have ample spaces equipped with electric outlets to maintain the desired temperature.

From the container park the containers can be again placed on chassis and transported to their destination by a stub-nosed truck or to a nearby rail connection to be placed on flat cars; or to a barge terminal; or even to an airport.

Customs inspection in some countries takes place at the point of destination, say an inland warehouse or factory. Similarly, the containers may be stuffed at the point of origin in the shipper's factory, customs inspected there, and sealed.

For less than container loads, the stuffing and consolidation may be done at a shed within the container port or at a nearby freight station. Similarly, at the destination port there must be a shed for opening such containers and sorting out the consolidated cargo for customs inspection and despatch to the several consignees.

VI. Has containerization reached Asia?

The container revolution reached the West Pacific in 1968, the first

full container ship departing Tokyo in September of that year; and progress has been phenomenally rapid. Today Japan's 5 major ports—Tokyo, Yokohama, Nagoya, Osaka, and Kobe have full-fledged container ports. Around 60 per cent or more of general cargo between Japan and the U.S. West Coast now moves in container ships and, it soon will be close to 100 per cent. The Japanese shipping lines are building many container ships; and container service to the U.S. East Coast and to Europe is expected to get underway within a few months. Hong Kong now has one container berth and plans a new container port; meanwhile numerous containers are being handled, both in and out, with ship's gear or floating cranes or other

Progress of Merchant Navy

INDIA ranks 16th among the maritime nations of the world.

A significant feature of the Indian merchant fleet is its diversification. It includes oil-bulk-ore carriers, crude carriers, petroleum product carriers and dry cargo tramp and liner vessels. We have a total of 289 ships, aggregating 35.69 lakh GRT, 230 of which are engaged in overseas trade and the rest in coastal shipping. In addition, orders have been placed for 92 ships of 23.30 lakh GRT making a total of 52.17 lakh GRT.

The shipping target for the Fourth Five-Year Plan was fixed at 35 lakh GRT in operation and 5 lakh on order. As against this, by the end of the Plan, the net operative shipping tonnage reached about 30 lakh GRT, with 23.30 lakh GRT on order. The overall target has, therefore, been exceeded.

Almost 50 per cent of our total merchant fleet today is run by the public sector undertakings, the Shipping Corporation of India and the Mogul Line. The Shipping Corporation of India is among the largest shipping companies in this part of the world. It has a fleet of 112 ships comprising 17.05 lakh GRT including oil-bulk-ore carriers, cargo vessels and coal carriers. Orders have been placed for additional 37 ships totalling 13.18 lakh GRT. By December, 1976 the fleet of the Corporation is expected to comprise at least 137 vessels of over 26.65 lakh GRT.

The targets for the Fifth Five Year Plan have been fixed at 36 lakh GRT in operation and 10 lakh GRT on order. These targets are considered to be the bare minimum. At present our ships are able to carry about 20 per cent of the total overseas trade, and the rest is taken by foreign companies causing a great drain on foreign exchange. With the attainment of the proposed target, Indian fleet would be adequate to carry 100 per cent of the country's overseas trade in crude oil and petroleum products, 100 per cent of iron ore export to Europe 50 per cent of iron ore export to Japan and about 50 per cent of

the liner trade in other commodities.

The composition of the merchant fleet has been designed keeping an eye on the modern trends in shipping. As it is more economical to ply bulk carriers than the smaller vessels, over 35 lakh GRT of the total tonnage target in the Fifth Plan would constitute the OBOs. The country will be importing crude oil and petroleum products around 34 million tonnes annually. To carry it cent per cent we might need tankers of over 13 lakh GRT. By the end of the Fifth Five Year Plan, we have planned to acquire the entire 13 lakh GRT of tankers. In addition, 20 lakh GRT has been provided for liner vessels, 10 lakh GRT for the smaller tramps, and 6 lakh GRT for coastal vessels.

The fleet pattern has undergone a noticeable change even as compared to the shipping tonnage so far achieved during the Fourth Plan. The tanker tonnage is proposed to be increased five-fold and the bulk carriers four fold. The tonnage of tramps will be trebled and that of liners doubled.

Investment in the shipping industry is a paying proposition for the nation. According to international practice, while buying a ship, we pay only 20 per cent of the cost of the ship at the time of booking the order. The rest is paid in eight equal annual instalments. Normally, a ship will recoup its cost in a five years operation. At the same time, the country saves valuable foreign exchange on importing and exporting goods in its own ships.

In 1971-72, the total value of our overseas trade was about Rs. 3,375 crore. As the normal freight forms 10 per cent of the total value of foreign trade, we would have paid a total freight of about Rs. 337.5 crore. The same year the total earnings of the Indian shipping was Rs. 174.85 crore although that year the cargo carried was only 16.3 per cent of our overseas trade.

PORTS DEVELOPMENT

The diversification of our merchant

fleet and emphasis on the acquisition of large bulk carriers—three very large crude carriers of 269,000 DWT each ordered by the Shipping Corporation of India are on the way—calls for the improvement and expansion of our ports to take in such ships. At present, Madras and Visakhapatnam ports can handle ships of 35,000 DWT each, and Marmugao of about 60,000 DWT but only in midstream. The Madras Outer Harbour has been commissioned to take in tankers upto 87,500 DWT. The Visakhapatnam Outer Harbour will be able to receive bulk ore carriers of 1 lakh DWT.

In the Fifth Plan, the capacity of Madras and Visakhapatnam Outer Harbour will be expanded to handle ships of 1.5 lakh DWT and that of Marmugao to receive ships of 1 lakh DWT. Oil handling facilities will be improved at Bombay and fertiliser berths provided at Cochin and Tuticorin, and a separate jetty at Kandla. An offshore terminal has been envisaged at Salaya in Gujarat to meet the requirements of crude oil for the refineries at Mathura and Koyali. At Haldia a separate berth is being installed to handle 2000 tonnes per hour.

Simultaneously, shipbuilding capacity of the country is also being augmented. In addition to a shipbuilding yard at Visakhapatnam another yard is under construction at Cochin. The keel of the first ship at the Yard will be laid during the current year. In addition, construction of two new shipyards will also be taken up and preliminary studies about these projects have already been initiated.

For promoting self-reliance in the design of ships, a Central Marine and Design Research Organisation will be set up during the Fifth Plan.

In spite of all these efforts, we will have to buy most of our ships from foreign yards. A measure of self-sufficiency in our requirement of shipping tonnage is expected to be attained only by the end of the Sixth Plan. □

improvised arrangements. Taiwan is now handling containers in and out at both Keeloung and Kaoshiung pending completion of new well-equipped container ports or berths under construction at both these ports.

Manila is handling some containers with improvised arrangements; and Singapore is building an entirely new and large container port, partially financed by the World Bank and now nearing completion.

Australia has container ports or berths, and there is already a large traffic in containerized cargo between Japan and Australia and between U.K. and Australia.

In India container berths are planned for both Bombay (at Nhava Sheva, its satellite port) and Haldia; the major Ports Commission. The Planning Commission has recommended in its final report of June, 1970, that full-fledged container ports be built at both these ports.

VII. What are the advantages of containerization?

Some of the economies are obvious: minimized handling costs, greatly lessened chances of breakage, protection from the elements, and elimination of pilferage losses.

There are other dramatic economies. As already noted, speed of unloading and loading is one economy, 10 to 20 tons in 2 or 3 minutes compared with about 300 tons in an 8-hour shift per batch; fewer men per gang but sharp upgrading of those required. As a consequence of less time in port and also of newer, faster ships, more voyages can be made per year and more cargo moved in a year. In the North Atlantic trades, for example, a container ship will move in a year 5 times as much cargo as a conventional ship of similar tonnage. In the India-U.S. trade, the voyage time for a container ship would be about 60 days, compared with 180 days for a conventional ship of similar size, 6 voyages versus 2 in a year. A container berth in India would cost about 25 per cent more than a conventional berth, but its throughout capability would be about 5 times as great.

VIII. But how to justify a capital intensive investment in a lesser developed economy where there is a plentiful supply of labour with correspondingly low wage rates? The answer is very simple, for two reasons:

1. Manual loading and unloading imposes a very wasteful use of a very expensive piece of capital equipment, namely, a ship costing

millions of dollars of scarce foreign exchange.

- a. Port congestion means berthing delays and unduly long time for unloading and loading.
- b. Standing charges of a ship average about Rs 15,000 per day.
- c. These costs must be reflected in ocean freight rates and vessel charter rates and hence represent a charge on the Indian economy.

2. Manual loading precludes efficient unloading at destination ports:

- a. Break-bulk loading largely imposes break-bulk unloading, which is increasingly prohibitively costly at high labour-cost ports.
- b. Stevedoring costs at U.S. ports are 10 times as high per ton as the Indian rate; and at major European ports 6 times as high as in India. Freight rates in the India-U.S. East Coast trades rose 81 per cent in 9 years (1960-69) or 6.8 per cent a year, reflecting in large measure the rising costs of port congestion in India and the costs of unloading break-bulk cargo in U.S. ports. Cost of delayed berthing of ships at India's seaports amounted in 1965-66 to 8500 ship days or about \$ 17 million, or about 13 crore of rupees; and in 1966-67, 18,900 ship days or \$ 38 million or about 29 crore of rupees.

It is abundantly clear that manual handling of cargo at India's seaports is a luxury that India can ill afford. Moreover, it is equally clear that failure to mechanize handling of general cargo will be at the risk of losing India's export trade to the more developed countries because of the increasingly prohibitive cost of unloading break-bulk cargo at their seaports. And it must be remembered that more than 70 per cent of India's export trade goes to the more developed economies. It may be that containerization represents the most profound technological revolution in maritime commerce since the invention of the steamboat. India as a growing maritime nation must share in that revolution.

As one Indian shipping official has expressed it, India is being surrounded by container ports and in self-defence she too must have container ports. The alternative for containerizable general cargo is to see India's seaports reduced to the status of feeder ports serving such major container ports as Singapore.

Revolution in Cargo Handling

S R. BOSE

WE are living in a most exciting time of trade and technology. Many new ideas and applications will be forthcoming in this field. Self-dumping Carriers, LASH, TRISEC, SEALIFT—these are merely pointers to the future. To men of vision and imagination the horizon is wide open, the changing concept of today's system is only a forerunner to the enormous possibilities of the future but the trend is quite clear. Only a few Super Ports will survive the challenge of time and technology to share the major portion of the International trade. Rotterdam's Europort, Vancouver's Roberts Bank Project, Quebec's Sept Isle/port Cartier complex and some of the major ports of U.S.A., Europe, Japan and Australia are becoming the pace setters of this trend. So, we have only two options. We can either look around and take advantage of the enormous possibilities left open to us by technology or we can bury our head in the sands like an ostrich. In Haldia, we decided to look around. Our idea in creating facilities for bulk oil, ore, coal, phosphate, fertiliser, chemicals and salt handling, the container berth, the finger jetty for transfer loading is but a modest effort to take advantage of this 'changing Concept in Cargohandling'. It is indeed an effort for survival. The idea was conceived more than 10 years ago. It took a lot of convincing. One of the main obstacles was that it would cost a tremendous amount of foreign exchange—a very scarce commodity. Finally it was decided that the equipment have to be built in the country—a momentous decision and perhaps the biggest challenge of all. □

Shri Bose is Deputy Chief Mechanical Engineer, Calcutta Port.

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PORTS : Some Terms Used

Ports. A port is a gateway to the land from the sea and from land to the sea. Originally the word port was derived from the Latin word *porta*, a gate, signifying an entrance.

Harbours. The first qualification of a port is an adequate degree of shelter. The idea of shelter is, perhaps, primarily and more closely associated with harbour. A harbour is a place of shelter for ships, but the harbour is not necessarily a port. A harbour of refuge, as its name signifies, affords shelter only and does not provide facilities for the handling of cargo. Harbours are either natural or artificial.

(a) A natural harbour is generally an indentation in the coast line sufficiently enclosed, or protected by its environment and topographical features, to provide a tranquil water area for shipping.

(b) An artificial harbour is an artificially developed harbour. In the absence of natural features, protection for harbours has to be sought by artificial means. The principal feature of artificial harbours is the breakwater, the object of which is to break up and disperse waves, and so prevent them from producing agitation of the water surface within the harbour area. The breakwater may be of rubble mound or a wall.

Dock. Dock is a completely enclosable place in a sea or river by gates or otherwise, and not continuously in free or open communication with an outer waterway. Dock may be of several types—wet, dry graving, floating and ship.

(a) The *wet dock* is a dock in which water is retained for the purpose of receiving and berthing vessels alongside its walls or quays, and so keeping them continuously afloat at all stages of tide.

(b) A *lock* is a small antechamber to a dock with dimensions sufficient to accommodate the largest single ship likely to make use of it. It has two pairs of gates, one at each end, communicating respectively at the outer end.

(c) The *dry dock* is the converse of a wet dock. It means the chamber, the floor and sides and one end of which are lined with watertight material, such as concrete or stone, and the other end provided with

a pair of gates, caisson, or other means of closure, for the purpose of excluding the water during such time as the dock is occupied by a ship for the purpose of repairs.

(d) The dry dock is often referred to as *graving dock*, being applied to the process of scraping, cleaning, painting, or tarring the underside of a vessel's hull.

(e) A *floating dock* is a dock structure which floats. It is generally constructed as series of pontoons or chambers which can be emptied of water so as to provide the necessary degree of floatation. A floating dock consists of a floor or platform, with two side walls, all steel framing and plating, upon and sunk to a sufficient depth to allow the vessel to float on it, the pontoons are pumped out and the vessel is raised above water surface level, exposing its entire lower surface and enabling repairs to be carried out in the open.

Jetty Wharf and Pier. A *jetty* is something which juts out. The term *pier* is also used interchangeably for jetty. In marine terminology the sense of detachment is uppermost. In some quarters its application is to a landing stage for passengers, but even then the idea of detachment is justified in the sense that many such landing stages jut out into a river or the sea.

The *wharf* is a structure for ber-

thage purposes, flanking a riverside and only distinct from a quay in that, as a rule, it is constructed of piles and framing instead of solid masonry or concrete. The *quays* are generally accepted as being substantially built river or sea walls, along side which vessels may lie. Both wharves and quays are provided with adjacent space for receiving and loading goods.

The *crane* is a machine for moving heavy weights. Used for loading and unloading ships.

The *liner* is a class of shipping service which provides a regular service between specified routes. The liners are generally bigger and faster vessels and their charges are also higher.

The liners are divided into (a) mail and passenger ships which carry passengers, mail, and high class goods, (b) cargo liners which are goods or cargo carriers and provide regular service exclusively for carrying cargo, and (c) combination liners which carry both goods and passengers and have a large space for goods separately.

The *tramp* is a handy sized vessel, capable of visiting a large number of ports and of being employed in many different trades; thus "she is ready to go where there is money to be made."

Shipping Conferences or Rings are combination more or less of shipping companies formed for the purpose of regulating or restricting competition in the carrying trade of a given trade route or routes.

Lighthouse is a tower with a light to guide ships.

P.O.L. Petroleum and oil products

TOPIC

for the next Students' Forum is a logical extension of what you have discussed in the previous Forum. Having come to the consensus that active politics as we know it today is not for the active student, should we take the ostrich as our mentor and bury our heads in books? We, therefore, invite your suggestions on

HOW TO MAKE STUDENTS A FORCE FOR CHANGE

Contributions should not exceed 250 words. Typewritten or legibly written out in hand, as the case may be. Give both your school/college and home addresses. Letters should reach the Editor, Students' Forum, Room 505, Yojana Bhavan, Parliament Street, New Delhi 110001, before 20 February 1975. But write in as early as you can, before the exams claim most of your time!

INDO-U.S. RELATIONS

History seems to demand much of democracies, insisting that they from time to time undergo severe tests. Like the American Republic, India has impressively surmounted each without sacrificing its fundamental democratic institutions.

DANIEL PATRICK MOYNIHAN

U.S. Ambassador in India

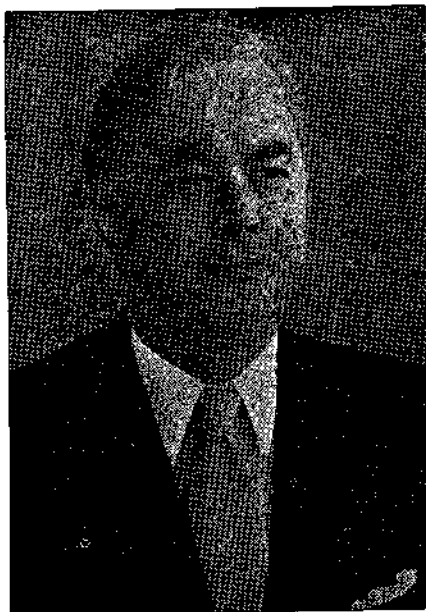
I JOIN in saluting the Republic of India on its twenty-fifth anniversary. The formation and consolidation of democratic institutions in a brief quarter century, in a world of rapid change and recurrent crisis, is an accomplishment worth celebrating. Indians, Americans, people who value such institutions... can take pride in this anniversary.

I recall that twenty-five years after the promulgation of the United States Constitution the American people were absorbed in a struggle for survival, in a conflict described by some historians as our "second war of Independence." In August 1814 the enemy marched on the capital city Washington and burned public buildings, not even sparing the White House. Gloomy prophets of the day predicted the early collapse of the Republic.

History seems to demand much of democracies, insisting that they from time to time undergo severe tests. The people's devotion to their institutions must be assayed, and the institutions themselves renewed. The Republic of India, like the American Republic, has had to face serious crises since its first Republic Day. And like the American Republic it has impressively surmounted each without sacrificing its fundamental democratic institutions.

Much to the credit of Indian statesmanship this twenty-fifth Republic Day is being celebrated at a time of peace. It is imperative that this peace endure. My Government supports political stability and economic progress in South Asia, and is keenly aware that neither is attainable in a Subcontinent preoccupied by tension or war. My Government also recognizes that India's size and position gives it "a special role of leadership" as well as a special responsibility in South Asia and the world. We applaud and support India's contribution to what has become known as the "Simla process". It testifies to India's continuing acceptance of this special role.

As conflict and tension recede into the past in South Asia, and as



the United States and India embark on a more promising bilateral relationship, the question of how we can best serve the common goal of economic progress comes to the fore. To my mind there is one obvious answer: we can intensify efforts to expand trade and commerce. A Subcontinent at peace, a more mature bilateral relationship—these can translate, with the proper effect on both sides, into increased trade and closer economic cooperation. The American and Indian peoples are resourceful and inventive: bring them together in trading relationships, let the laws of mutual advantage operate, and there will be short and long-term benefits for both the countries.

It is true that the economic side of the Indo-US relationship has not languished in recent years. The United States is already India's largest trading partner; we are by far the leading source of Indian imports, and are second only to Japan as purchasers of Indian exports. Indo-American trade turnover exceeded one billion dollars in 1973. Recently our trade relations have been marked by well-publicized successes: in May 1974 the Indian Government announced contracts with two groups of Ameri-

can oil companies to drill off shore on India's east and west coasts.

But a handful of economic statistics and several recent headlines do not give the full perspective. Sketch in the shadows and find that—

India accounts for only a fraction of one per cent of the total U. S. purchases from foreign markets.... India stands number twenty-six on the list of all U.S. trading partners.

Indian and American firms too often operate in the dark about the trade and investment opportunities, and about government and market requirements obtaining on the other side.

Government policies sometimes discourage otherwise promising trade and commercial relationships.

The fourfold increase in oil prices has created strains in both economies, curtailed India's foreign exchange resources, and threatens to create other problems.

What is to be done about these problems? Are they to dictate the outer limits of future cooperation? How should we react?

In one sense we have already reacted. One important result of Secretary Kissinger's visit to New Delhi in October 1974 was the establishment of a Joint Indo-U.S. Commission with an auxiliary Economic and Commercial Subcommittee. We believe that this new institution can and will play a vigorous part in determining the future climate and conditions of Indo-American economic cooperation.

The tasks of the Commission in the economic area, as spelled out in the Agreement signed by Secretary Kissinger and Foreign Minister Chavan on October 28, are:

- (A) To review matters concerning economic and commercial relations between the two countries;
- (B) To identify and investigate areas for closer cooperation, to make joint studies in areas of common interest and to recommend programmes concerning economic growth and development through mutual cooperation;
- (C) To recommend measures and activities to stimulate two-way trade between the two countries consistent with their international obligations, which may include *inter alia* the sending of trade promotion missions and trade delegations;
- (D) To promote possibilities of increased investment consistent with the investment policies of the two countries; and
- (E) To explore possibilities of enhanced cooperation between



V.F. MALTSEV

USSR Ambassador in India

INDO-USSR RELATIONS

Soviet-Indian friendship is becoming a permanent, effective factor that should be reckoned with in the present-day international relations. The Soviet people rejoice at the achievements of India and her people's efforts for development.

THE 25th anniversary of the proclamation of the Indian Republic is being celebrated, along with the Indian people, by a great number of friends of India abroad who have over many decades followed the national-liberation movement in India with profound sympathy.

Progressive-minded people of Russia were always among those who sincerely believed in the triumph of the just cause of the Indian people and shared in all the thoughts and aspirations of the Indian people.

The victory of the Great October Socialist Revolution in Russia

gave a powerful impetus to the national liberation movement in India. The founder of the first Socialist State in the world, V.I. Lenin emphasised that this movement "can succeed only through close link with the revolutionary struggle of the Soviet Republic against international imperialism."

Many prominent political and social figures of India have observed with great interest the all-round successes of the Soviet people in the building of socialism, seeing in them the key to the solution of many complicated problems faced by India since independence.

(Continued on next page).

financial, industrial and commercial institutions and organizations.

Business will not be formally represented at the outset inasmuch as the Subcommittee is an inter-governmental body. But American and Indian businessmen can be assured that we will develop the necessary tie-in to the private sector; we recognize that, at least on the American side, it is mainly the businessmen, not the bureaucrats, who make the choices which, ultimately and cumulatively, determine the shape of Indo-American trade.

Although India and the United States share many traditions and institutions, our businessmen and government officials still have much to learn about the workings and interrelationships of government and commerce in each other's country. On occasion there is a plain lack of information, at worst there is misinformation. The sum result in given trading situations is distorted expectations. The Economic and Commercial Subcommittee, by bringing together experts from both countries, offers a forum where such expectations can be tested and, where appropriate, corrected. And the Sub-commission serves an educational purpose in a more positive sense as a forum for exchanging ideas on the feasibility of new forms of cooperation. Why should not American and Indian businessmen take advantage of the opportunity to seek new and imaginative ways of increasing their contacts to find

additional ways for mutually profitable two-way sales? Why should not they look for new ways of working together in India, in the United States, perhaps elsewhere as well? The Economic and Commercial Subcommittee also promises to be a forum where American and Indian experts can identify specific policies and practices which now inhibit or obstruct expansion in trade and commerce — to single out for particular attention or study problems encountered by Indian firms competing in certain markets in the U.S.—or to focus on possible

will be the quality of its recommendations, their political and economic practicality. Even if a final judgment on the Commission and its auxiliary body must await future patterns of Indo-American trade, there will be satisfaction in both capitals and business communities in the recommendations they yield in their first year are sound and practical.

It seems only appropriate that India and the United States prepare to celebrate important anniversaries—India's twenty-fifth Republic Day this year and the United

I admire India's effort to make democracy work. It has been a marvellous effort considering that it is only 27 year old. But I am not going to India to tell the Indians what to do. I marvel at what they have been able to do.

—William Saxbe, the U.S. Ambassador-designate to India

problems facing potential investors in Indian projects. We all have an interest in identifying and candidly discussing those factors which operate to discourage closer economic cooperation.

It is important for both sides that the Commission overseeing the Subcommittee's work is expressly called upon by its charter (the October 28 inter-governmental agreement) to "recommend measures and activities to stimulate two-way trade between the two countries...." For the true criterion of the worth of this novel Indo-American institution

States' two hundredth year of Independence next year—they should launch a new institution devoted to strengthening of Indo-American cooperation. The Joint Commission with its auxiliary body, by providing a framework for cordial and candid exchanges on a basis of equality, is both compatible with an apt symbol of a new era in our relationship. Those of us entrusted with strengthening Indo-American ties in trade, commerce and other fields must now work together to vest this symbol with concrete, lasting meaning.

It will not be out of place to mention here the view of the great son of India, Jawaharlal Nehru, who wrote: "The Soviet revolution had advanced human society by a great leap...It had laid the foundation for that new civilisation towards which the world could advance...Russia attracts us because it can help us find a solution to enormous problems which the world is faced with at present."

Beginning

The establishment of diplomatic ties in 1947 between Soviet Union and India provided a powerful impetus for the development of Soviet-Indian relations in the political, economic, trade, scientific and cultural fields.

Of great importance were the Soviet visits of Jawaharlal Nehru. During his visit to the Soviet Union in 1961 he characterised in the most eloquent way the essence of Soviet-Indian relations: "The Soviet Union has given (India) many precious gifts, but the most precious of these is friendship."

The mutual visits of Soviet and Indian leaders have become a part and parcel of the political cooperation between our two countries and a good and healthy tradition in the relations between them. Prime Minister Indira Gandhi, who is held in great esteem by Soviet people, has visited the Soviet Union several times, and so have many other Indian statesmen, political and social figures.

Soviet leaders—L. I. Brezhnev, N.V. Podgorny, A.N. Kosygin and other state and political figures have also visited India. Such mutual visits provide an excellent opportunity to exchange views at a high level on topical international problems in a businesslike and frank atmosphere, to outline prospects for further development of bilateral relations and to suggest and coordinate new forms of mutually-beneficial cooperation between the two countries.

The positions of the Soviet Union and India on many important international problems either coincide or are very close, which is evident from a large number of joint declarations and communiques. For example, the approach of the Soviet Union and India to the problems of Indo-China, to the problem of a peaceful settlement in West Asia and to questions of disarmament is identical. Soviet Union and India are striving for speedy and complete liquidation of the remnants of colonialism, and for the unconditional implementation of

the UN Declaration on granting independence to colonies and peoples. Both the countries resolutely condemn all forms of racism, apartheid and genocide.

Treaty and After

The all-round, equitable and mutually beneficial character of Indo-Soviet cooperation created favourable prerequisites for concluding the Soviet-Indian Treaty of Peace, Friendship and Cooperation in 1971. The Treaty, on the one hand, consolidated all the beneficial and positive achievements and put them on a legal basis; and on the other hand, opened new vistas for further strengthening Soviet-Indian friendship and cooperation. Within the short period since its signing, the Treaty has clearly demonstrated its effectiveness to the whole world as an important instrument for the preservation of universal peace and for strengthening international security and stability, particularly in the South-Asian subcontinent.

The central event in the development of Soviet-Indian relations over the past few years has been the official friendly visit to India of the General Secretary of the CPSU Central Committee, Comrade L. I. Brezhnev in November, 1973. This visit took place in an atmosphere of massive demonstration of friendship between the peoples of our two countries. It came as another confirmation of the peace-loving policy of the Soviet Union in Asia and in the entire world and of the policy of all-round development of relations with India and strengthening of the principles of peaceful coexistence of states with different social systems.

It is indeed right to say now that Soviet-Indian friendship is becoming a permanent, effective factor that should be reckoned with in the present-day international relations.

While assessing the historical path of India and her successes after Independence, one has to keep in mind the grave legacy left behind by the colonialists, which seriously hampered the economic, political, social and cultural life of the country.

The Soviet people regard with great understanding the determined efforts of the Indian Government for all-out development of the national industry and agriculture, for the achievements of economic independence and are closely following the successes achieved by India in these fields in the recent times.

The Soviet people rejoice at the achievements of India and feel proud because through the cooperation of

Soviet Union it has become possible to build in India a number of vital modern public sector enterprises which have become a reliable basis for her industrial development.

At present, on the basis of the inter-governmental agreements and also by the provisions of commercial credits by the Soviet Union to India, some 72 industrial and other enterprises have been either built or are under construction with Soviet assistance. Out of these 49 enterprises and projects have been either fully or partly commissioned. At present, these enterprises turn out upto 30% of the total production of steel in the country, produce upto 35% of petroleum products, 20% of electric power, 80% of heavy machinery etc.

New Prospects

The Agreement on Economic and Trade Cooperation concluded in Delhi on 29th November, 1973 during the visit of L.I. Brezhnev, has opened new prospects for the development of Soviet-Indian economic relations. The talks of L.I. Brezhnev with Mrs. Indira Gandhi in Delhi resulted in providing a powerful stimulus to the further development of cooperation between the two countries in the fields of economy, trade, science and technology. The Soviet-Indian agreements give a stable character to this cooperation, determine its main directions for the coming 15 years and what is more, regulate the industrial cooperation on the basis of mutual supplementation of the economic potential of the two countries.

Of great significance in this context is the conclusion of the agreement on cooperation between the State Planning Committee of USSR and the Planning Commission of India which creates favourable conditions for the coordination of the current and prospective plans of the economic development of the two countries. It acquires special importance in the wake of the economic crisis which is gripping a large number of capitalist and developing countries of the world.

It could also be mentioned here that India's trade with the Soviet Union, at present, is the most dynamic sector of the Indian foreign trade. The rate of growth of trade between the two countries is higher than the general rate of increase in the foreign trade of both Soviet Union and India. Over the last 20 years, since the conclusion of the 1st Soviet-Indian trade agreement, the trade turnover between USSR and India has increased from Rs. 13 million in 1953 to Rs 4.1 billion in 1973. (Contd.)

As is known, the Soviet-Indian Declaration envisages further increase in the trade turnover between the two countries by 1.5 to 2 times by 1980. The foreign trade and planning bodies of the Soviet Union and India are at present actively engaged in the practical realisation of this goal. The long-term nature of the trade agreements between India and Soviet Union lend a planned character and stability to the foreign trade.

We are fully confident that the multifaceted cooperation between the Soviet Union and India, which

is maturing on the basis of the principles of respect for sovereignty, territorial integrity and non-interference in the internal affairs of each other, of equality and mutual advantage, will further develop successfully in the interests of general peace and security and for the good of the people of our two countries.

I would like to conclude with a quotation from the speech of L.I. Brezhnev at the Civic Reception at Red Fort on 27th November, 1973, which characterises in the best possible way the essence of Soviet-

Indian relations,

"Friendship and cooperation with India is the corner-stone of the foreign policy of Soviet Union. We were with you when India was still a colony. We were with you when India's new statehood was emerging. We were with you in the difficult and trying periods of India. We were with you when various external forces were trying to bring pressure on your country when it was upholding its vital interests. And we shall be with you in the days of joy and in the days of trial."

IRRIGATION : Record of 25 Years

K. L. RAO

We have the largest cultivated area in any nation. In their magnitude and number, there are not many in the world to compare with India's irrigation projects. If we have more than doubled our food output since Independence it is largely due to extended irrigation. Still, our agriculture continues to be a gamble in rains. Why ?

We have 13 major river basins and the total water in all the river systems approximates 17 million cubic metres, the Ganga and Brahmaputra alone accounting for 61 per cent of the total. Though our achievements have been impressive, our basic approach to problem of water conservation and utilisation has not conformed strictly to national priorities. All major river projects must be treated as Centre's responsibility and they should not be subjects of inter-State disputes. A national River Grid would, in the long run, benefit every part of the country and unless we muster our courage, resources and imagination to implement a grand strategy, we cannot eliminate the dread of scarcity.

IRRIGATION in India is related to the vagaries of monsoon. If the rainfall occurs throughout the year, even though the total amount per year may not be much, irrigation would not be necessary. Thus in U.K., though the total annual rainfall is only 1100 mm and is about the same as in India, no irrigation is necessary as rains occur practically throughout the year. In India, this is not the case. Three-fourths of the rainfall occurs during four months of June to September

and even this varies from year to year and from place to place because of its vast size and situation in Tropical latitudes. Thus, agriculture has long been a gamble in rains in most parts of India.

Our total cultivated area is 160 million ha (gross). Ten per cent of this land is located in high rainfall regions like Assam hills, Himalayas and Western Ghats where irrigation is not generally required for the first crop. A third of the land is located in arid and semi-arid regions where any substantial agricultural production, specially of cereals like rice and

wheat, is impossible without irrigation. In the rest of the country irrigation is required to meet the crop water requirements and for multiple-cropping when rainfall fails.

Irrigation has been practised in India from very ancient times. Lord Buddha refers to irrigation in Dhammapadam thus:

"Irrigators lead the waters
Fletchers fashion the shafts
Carpenters bend the wood
The wise control themselves"

The irrigated land was 13 million ha at the beginning of this century and became 22 m. ha. by the middle of the century. In view of the relatively smaller population in those times, the food produced in the country proved generally sufficient. If certain areas which fell deficient in production suffered from extreme scarcity conditions, it was principally due to lack of quick transport facilities. Droughts continue to occur in India as they have all along but famines have been nearly eliminated because of the extensive rail and road transport system.

Increase of Irrigation Since Freedom

One of our great achievements since Independence has been in the field of irrigation. From 22 million ha we have practically doubled the area under irrigation by building a number of irrigation and multipurpose projects. Some of these are very large. There are 11 projects

n operation, each irrigating more than half a million ha and another 10 such large sized projects are in an advanced stage of construction and are already yielding partial benefits. In their magnitude and number there are not many like them in the world. Large storage reservoirs have been constructed. Before Independence, the largest in India was the Mettur reservoir across the Kaveri with a live storage capacity of 2600 million cu.m. There are now ten reservoirs of much larger capacity, the largest being 7400 million cu.m. at Bhakra. The construction of these mammoth projects presented peculiar engineering difficulties. This vast increase in irrigation potential has resulted in practically doubling our cereal production in the last two and half decades.

Sources of Irrigation

There are 14 major river basins, each with a drainage area of more than 20,000 sq. km. and 44 medium basins of 2000 to 20,000 sq. km catchment. The total water in all the river systems in India has been roughly estimated as 16,45,000 million cu. m. The Ganga and Brahmaputra carry 61 per cent of the total water and only 20 per cent of Indus waters is available for India as a result of our agreement with Pakistan. The water flowing in the other river systems is inadequate and there is therefore a scramble for a larger share of waters among the States.

Most of the irrigation by river waters is provided by gravity flow by canals taking off from barrages or dams across the rivers. Recently pumping is also being adopted to lift the waters from river on to the lands. Another notable feature of some of the lift irrigation schemes is the replacement of permanent head-works by floating pump-houses. This reduces the period of construction and cost. Dalmau and other floating pumping stations on the Ganga are excellent examples where waters sufficient for 50,000 ha and more are being supplied.

Another valuable source in India is ground water. There are three different regions in the country contributing ground water. In the hard rock areas, the yield of wells is small as the main storage in the ground is in the fissures and faults of rock. In deep alluvial soil basins like the Ganga, copious supplies exist and a bore hole yields many times more than in the rock strata. Ganga basin is a precious mine of water. Nearly 15000 tubewells have been sunk, serving one million ha. Narmada valley is also found to be another area where ground water is

in plenty. A third type of ground water location is in other alluvial regions like the delta mouths of river systems like the Godavari, Krishna, Kavery, etc. The yield of the wells in these regions, while not so plentiful as in the Ganga basin, is nevertheless substantial. As of date, there are nearly seven million shallow wells and 8,00,000 bore wells which are providing irrigation waters for about 15 million ha or about 35 per cent of the total irrigation area.

Besides the above types, another source is the numerous tanks, specially in the semi-arid region of peninsular India, which serve to store rain waters. These come in very handy during the lean periods and help in raising a second or *rabi* crop. But as rains in the semi-arid region are unpredictable, the tanks often do not get filled and the farmer has to suffer great hardship.

Yet another source of supply is, if not water, moisture, sufficient for sustaining the plant life. This is obtained by contour bunding. These bunds prevent the rain water from draining away and they hold back, enabling the water to sink into the ground.

Importance of economies in water utilisation by lining the water conductor systems and use of sprinklers is now being realised and is bound to be increasingly adopted in future. This will easily extend the area under irrigation by 10 to 15 per cent. The percentage of areas now being served by water from various sources are given below:

Source of irrigation	Percentage of area
Canals	46 per cent
Tubewells and wells	35 per cent
Tanks and other sources	19 per cent

At What Cost Irrigation

The cost of irrigation has gone up very greatly in the last decade. It was costing hardly Rs 70 to Rs 175 a hectare in the last century for diversion and storage works, respectively; Rs 250 to Rs 750 before 1950, and now it is Rs 1400 to Rs 3750 per ha because of increased cost of construction materials like cement and steel and also labour. Another peculiar feature of the increased costs is that the rise is mainly due to canals and not dams as it used to be twenty years ago. This is due to increased costs of equipment, fuel and skilled labour required for canal construction. The increased costs of irrigation have vitally affect-

ed the extension of irrigation and retarded the planned construction programmes. Between 1951 and 1966, the total expenditure on major and medium irrigation projects was Rs 13,360 million and the benefits achieved were 7 million hectares while in the last eight years alone, the corresponding figures are Rs 16,300 million and 4.6 million ha. This enormous increase in cost has to be countered at least partly by adoption of improved techniques and by participation of the people in the construction activities. Both are not in vogue now with the result that the cost of providing water has soared very high.

Mistakes We Have Made

Any large undertaking will always show up some mistakes. It may pertain to policy formulation or execution. Wisdom consists in avoidance or repetition of these. So, in the irrigation sector also where large amounts of money have been spent there have been mistakes. Let me discuss these briefly.

Faulty Financing

When a project is undertaken, sufficient finances must be provided to complete it in a period of 5 to 10 years depending on the size of the project. Projects which will involve longer periods of construction must be so designed that the first phase should be independent and be completed in at least ten years. Non-observance of this simple rule has, in practice, set back the entire economy of irrigation projects. Take for example the Rajasthan Canal. The project was estimated to cost Rs 66 crore and the first phase which really has all the components of second phase as well, was to have cost Rs 45 crore. It was started in 1957. Even the first phase has not so far been completed now. If only the required outlay, including also the unavoidable increase in costs during the construction period, had been provided in the first ten years, the project would have yielded to the nation agricultural output of the approximate value of Rs 120 crore per year. On the other hand, prolonged and fruitless discussions took place year after year between the Rajasthan State and the Planning Commission, the former trying to decrease the allotment and the latter trying to increase it within the overall limit of the State Annual Plan.

Another example is of the Nagarjunasagar Project across the Krishna. The project was started in 1954 and has not yet been completed. This was again due to faulty financing. In

many years, the allotments were of the order of Rs 5 crore a year while something like Rs 50 crore should have been actually spent. The latter figure is no flight of fancy. I am glad that Uttar Pradesh Government is spending on the Sarda Sahayak Project about Rs 50 crore this year. So long as the projects, results of which accrue to the whole nation, are to be financed from the State budgets, the dilemma of inadequate financing would continue to confront us. Production should be the most important National objective and deficit in food will result in the ruin of the nation. When this is so, why are our major irrigation projects not being financed wholly by the Centre? I personally see no logic in the present practice of making them depend on States' resources.

Increased costs are said by some to be responsible for not completing the projects. This is not correct. Sufficient amounts were provided in the State Plans from year to year. The original cost and the increased costs for some projects is given in the table below.

The cross of projects have gone up by 2.5 to 4 times of the original estimate and this is predominantly due to delay or extension of the period of construction, far beyond what the planning engineers had envisaged. If adequate finances are not available for planned projects the undertaking of the projects itself must be staggered. All this would imply some discipline based on a well thought out scheme of national priorities. How bad the present situation is can be judged from the fact that 99 major and 513 medium schemes were sanctioned for Rs. 2,329 crore and were expected to yield irrigation benefit to about 22 million ha. So far we have spent more than Rs 2,800 crore but we have achieved only about 50 per cent of this benefit. We require at least another Rs 2,000 crore before we can achieve the full potential. This is mainly due to an

insistence on providing only as much funds for each project as could be accommodated in the State Plan ceilings. This was a mistake. Large irrigation projects must be treated as National Projects.

Some people think that irrigation projects invariably result in huge losses. This is not true. Only those, who have directly benefited from the projects know that this criticism is unfair. It stands to reason that those who are benefited directly by the project should pay more for the supply of water. This principle has to be insisted upon, if need be, by appropriate legislation. In the developed and rich countries like U.S.A. and USSR irrigation is provided at a very nominal cost or free of charge. In Japan lower, rates of interest are charged than for power projects. In India, where we do not have adequate finances, we can follow the example of Japan and charge a low rate of interest, say two per cent for the outlays on irrigation.

Wrong Classification and Emphasis

The classification of irrigation projects as major, medium and minor is arbitrary and misleading. A more correct classification would have been for surface water projects, and ground water projects, indicating the source from which the water is drawn. At present by minor projects are taken to mean projects which cost less than Rs 25 lakhs each. There is a wrong impression that minor irrigation projects can be completed much earlier and at less cost, and that benefits from them would flow quickly like river water. All these are wrong notions except when they apply to bore-holes and wells in alluvial areas. Small surface tanks are costlier than big projects on rivers for providing equivalent irrigation facilities. The benefits from tanks are of doubtful value. This wrong classification has led to wrong emphasis. Vast sums have been spent on minor irrigation. Out of the total

expenditure on irrigation, nearly 40 per cent has been spent on minor irrigation alone. In this sector, the projects based on deep wells alone can be useful. To know and regulate the expenditure on useful projects as a classification as suggested earlier would have to be adopted. This will also result in maintenance of accurate statistical information with regard to minor irrigation, for which there is now unverified data, which is not subject to scrutiny.

Many think that food production can be accelerated by use of chemical fertilisers and that it is the answer to scarcity. This assumption has led to the denigration of the importance of water. Chemical fertilisers involve recurring heavy expenditure and they cause deterioration of soil fertility when used for a number of years. They also have damaging effects on environment. Chemical fertilisers require lots of water. A study of Indian agriculture would indicate how greatly dependent we are for our food production on extension of water facilities, even more than on fertilisers.

Under-utilisation of Potential

There had been considerable under-utilisation of irrigation potential in the early plan periods. Of late, the position has improved. The latter was particularly noticeable in Kakrajpar (Gujarat), and Tungabhadra (Karnataka) projects. The reason for this was principally lack of experience on the part of local farmers in irrigating lands. The best way of rectifying this state of affairs is to encourage migration of experienced agriculturists from other parts of the country. This was done in Hirakud, Nizamsagar, and many other projects to great effect. The local people soon learnt the art of irrigating and gained adequate experience. In some projects, even the field channels are now being dug at the expense of the Government. This should be discouraged as people's participation is vital for economy and speed. Area development programme and provision of timely and sufficient credit will also encourage quick utilisation of irrigation potential.

Soil and drainage facilities must be investigated into as otherwise water-logging will occur after irrigation. This has happened in the Kosi Project where the utilisation of water is slow. Another reason is the excessive sand content in Kosi canals. In parts of the Chambal projects, water-logging has occurred due to lack of adequate drainage. Any of these undesirable features will

INCREASED COST OF PROJECTS EXTENDING OVER LONG PERIODS

Project	Original cost in Rs crore	Revised cost (rounded to the nearest crore)
Nagarjunasagar	91	312
Pochampad	40	146
Gandak	36	187
Ukai	61	120
Malaprabha	19	99
Upper Krishna Stage-I	58	153
Pamba	4	20
Tawa	20	72
Rajasthan Canal Stage-I	66	145
Parambikulam Aliyar	25	80
Ranganga	39	131

dampen the enthusiasm of local people and retard the progress of irrigation.

Our Achievements

Whatever we might have done or failed to do in other sectors, we have brought about a substantial improvement in irrigation facilities. The large increase in food production that India has achieved in the last 25 years is the direct result of irrigation extension. We have doubled the area under irrigation in the last two decades and the extent of irrigated land in India is the largest in the world. This is indeed a great achievement. Irrigation has also brought about a quiet socio-economic revolution. But for this basic input of water, famine would have haunted the land very often as it did in the pre-Independence era.

Even in the matter of utilisation of water potential, we have a much faster and better record than many countries, though the pace of utilisation could have been even quicker. We have also increased conservation of water in the rivers to 2,50,000 million cu. m. by undertaking a large number of storage dams. New agricultural techniques and implements have made the water supply doubly precious. Agricultural research in the country is keeping abreast and in consonance with increased irrigation facilities.

Future Programme

We have to look ahead now and plan on future irrigation schemes at least ten years ahead. The Bhakra and other similar projects took 50 years after investigation to be implemented. In India, there is great urgency to convert at least the semi-arid zones into food-yielding lands by providing irrigation water. Investigations for these must be taken up right now. A National Water Grid is the only answer to this and the surplus waters of the Ganga and the Brahmaputra must be used to augment supplies to deficit basins. Our objective must be to reduce the extent of rain-fed and unutilised lands by regular supplies of water. Scarcity areas in the Ganga basin itself such as Mirzapur, Rewa Plateau, Palamau and Gaya belt must be developed to become granaries even as the Krishna and Godavari Deltas have been converted into rice bowls.

Next in importance are irrigation projects for Gujarat and Madhya Pradesh, and in particular the exploitation of the Narmada. This river has not been harnessed so far, though it has the potential of producing rich agricultural wealth. Unfortunately, this has got bogged

down in an inter-State dispute on the sharing of its waters. It is most essential for the prosperity of India that the allocations of Narmada waters are settled early and work taken up on a priority basis so that we can reap the benefits in the next decade. The quantity of water in the Narmada is nearly equal to what we got from the Indus river. While the Indus system has been fully developed, substantial work on the Narmada has not even commenced.

It should be very easy to increase food production in the Ganga basin. Deep bore-holes can play a large part in achieving this aim. Water conservation projects like Kishau, Tehri and Rajghat dams must be built quickly. Storages on Sarda, Ghaghra Rapti are necessary to save eastern U.P. from floods and also for conserving water. These are international rivers and agreement with Nepal has to be entered into and the projects implemented. Projects already under construction have to be completed soon. They will provide irrigation to 10.5 million ha. with an outlay of Rs 2,000 crore.

Flood Control Works

Floods occur yearly and cause damage to crops in the eastern regions of India—in Assam, West Bengal, Orissa and Eastern U.P. In particular, the river basins of U.P. and Orissa must be controlled by detention reservoirs. In West Bengal,

increased drainage facilities will save much of the crops. It is estimated that the population of India in 2,000 A.D. would be around 900 million and cereal production should touch a target of at least 200 million tons. Other agricultural products like sugarcane and cotton are also of great importance to the common man. To increase our food production to twice its present output we need to double our irrigation. That is, we should add 40 million ha in the next two to three decades. This presents a formidable challenge to the nation but we have to face it. The important projects to be undertaken for such a programme may be listed as below:

	Benefits (million ha.) and Cost Rs. crores	
1. Parts of National Grid Irrigation for scarcity areas in the Ganga basin.	400	2.5
2. Harnessing Narmada for Madhya Pradesh and Gujarat	1000	2.5
3. Conservation projects on the Yamuna, Bhagirathi, Tapi, etc. in the Ganga basin.	2000	10
4. Ground-water exploitation	1000	5
5. Completion of projects already undertaken.	2000	10
6. Flood control in Ganga basin and Orissa reducing flood damages.	500	—
7. Conservation projects in Godavari and other basins.	2000	10

□

HARNESSING INDIA'S RIVERS

A number of major and minor irrigation projects totalling 593 were taken up after 1947. As a result the irrigation potential has increased fourfold with promise of further spurt as more projects are completed. Here is a glimpse of the Rs 4,000 crore massive effort to exploit our perennial water resources: the Nagarjunasagar project on the Krishna river in Andhra Pradesh, launched in 1956, created an irrigation potential of 4.07 lakh hectares by 1971-72. When the construction is completed and work on the canals on either side of the dam is over, an additional 8.3 lakh hectares will be irrigated. The dam on the Tungabhadra was a joint venture of Andhra Pradesh and Karnataka which brought under the plough over 5 lakh hectares of land. Gandak is a joint project, too, Bihar and Uttar Pradesh partnering it, with an estimated irrigation potential of 15.23 lakh hectares. Nepal also derives irrigation and power benefits from the project as it does in the case of Kosi project under execution in Bihar. Kosi has an irrigation potential of 4.34 lakh hectares.

Harnessing river waters calls for a concerted effort. One finds the States pooling their resources of both money and manpower in this regard, as for instance, Madhya Pradesh and

Rajasthan join hands to implement Chambal valley scheme which irrigates 5.66 lakh hectares. A significant example of mutual cooperation for mutual benefit is the Bhakra Nangal project, India's biggest multi-purpose river valley scheme with its canal system irrigating 14.6 lakh hectares. The partners of this project, Haryana, Punjab and Rajasthan have also joined hands to work in the Beas project, with an irrigation potential of about 17 lakh hectares. Parambikulam is yet another joint venture of Tamil Nadu and Kerala.

Hirakud in Orissa irrigates 2.54 lakh hectares while the Rajasthan canal brings water to 12.6 lakh hectares in the arid areas of Rajasthan. Upper Krishna and Malaprabha in Karnataka have an irrigation potential, respectively, of 4.09 and 2.07 lakh hectares; Kakrapar in Gujarat has 2.28 lakh hectares and Ukai in the same State commands 1.58 hectares. We have the Bhadra in Karnataka, Tawa in Madhya Pradesh, Ramganga in Uttar Pradesh, DVC, and Mayurakshi in West Bengal, Periyar in Kerala and many many more, all constructed (or being constructed) with the sole object of providing irrigation facilities to larger tracts of parched lands. □

WE have a Magna Carta built into our Constitution which provides at the same time for growth and equality. We have also had the advantage of one party being continuously in power and appropriate Acts in the Statute Book to ensure our quick march towards democratic socialism. We have, besides, a fairly good record of progress on the economic front in terms of production and

acquisition of know-how. All the same, we are still a poor country. The working people and the masses do not feel involved in the country's planned efforts for economic and social change, and the progress we have achieved is far less than what we had planned for. Disparities in income have increased and the benefits of development are mostly going to an elitist few. **WHY?**

The answer, in one sentence is, that we have so far failed to take adequate note of the living, human factor in our planning by creating a climate of socialist psychology which is an essential precondition to the growth of democratic socialism. The functioning of the impressive public sector which we have built in the past two decades or more is itself a proof of this observation, says the author.

OUR ECONOMY SINCE INDEPENDENCE

A Critical Evaluation

DR V.K.R.V. RAO

INDIA became an independent Dominion of the Commonwealth on August 15, 1947 and declared itself a Republic on January 26, 1950 giving herself a written constitution with a parliamentary democracy and fundamental rights for her citizens and the rule of law. From the economic and social point of view, the most important part of the Constitution is its Part IV on "Directive Principles of State Policy" which spelt out some of the salient features of the new society that the fathers of our constitution wanted to see established in our country. Though the provisions contained in this part are not justiciable and shall not be enforceable by any court. Article 37 of the Constitution clearly states, and I quote "The principles therein laid down are nevertheless fundamental in the governance of the country and it shall be the duty of the State to apply these principles in making laws". Article 38 to 51 give specific formulation of these principles and can be regarded as the *Magna Carta* of the new social and economic order that has been accepted as our national objective, and allegiance to which is contained in

the oath that the President, Vice President, Governors, Central and State Councils of Ministers, and Members of the Central and State Legislatures all have to take when assuming their respective offices. In any evaluation that is made of social and economic change in India after we became a republic with a written constitution, the touch-stone and the criteria for judgement has to be this *Magna Carta* which is contained in Part IV of the Constitution of India. I would add to this the acceptance of democratic socialism as the goal of Indian planning not only by the Congress Party which has been in power at the Centre continuously since Independence, but also by Parliament which represents the people of India.

How far have we succeeded?

How far have we succeeded in achieving the constitutional and the socialist obligations both of which in fact reflect, broadly speaking, the same or largely similar ideas regarding the kind of socio-economic order that we want to see established in India. Before answering this question, it would be but proper to give a brief account of the progress that has been achieved during this quarter century of Indian in-

dependence after the establishment of the Republic and the introduction of economic and social planning. The statement on the following page sums up the position as given by the Reserve Bank in its annual reports on Indian currency and finance.

The main strategy formulated for the achievement of the constitutional objective through the plans has been rapid economic development with continually rising levels of both agricultural and industrial production, removal or minimisation of inequalities of incomes and wealth, rapid and extensive development of the public sector with a view to accomplishing both this objective as also to regulate and influence the private sector of the economy to move in the same direction, establishment of equality of opportunities, workers' participation in industrial production, and the maximum possible cooperativisation of agricultural production, moving towards full employment, and the effective establishment of a national minimum standard of consumption.

It may be seen from the statistics given here that there has been significant advance in the Indian economy. But the planning strategy employed has not succeeded in fulfilling the constitutional objective.

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SELECTED INDICATORS OF NATIONAL ECONOMY

Item	Unit/base	1950-51	1960-61	1970-71	1972-73	1973-74
Net National Product (a)						
At current prices	Rs. crore	9530	13366	34217	38921	NA
At 1960-61 prices	Rs. crore	6600	13366	18885	19101	NA
Population	No. in million	361.0	442.2	550.2	573.6	585.4
Industrial production (general index)	1960 : 100	54.8	100.0	180.7	199.4	200.6
Agricultural Production (index) (b)	1951 : 100	100.0	149.1	175.9	177.3	163.2
Employment Exchanges:						
No. of applicants placed in employment (c)	000s	331	306	447	507	477
No. of applicants on live register (c)	000s	331	1606	4069	6896	8291
Money Supply with the public	Rs. crore	2016	2869	7140	9412	10836
Foreign exchange resources	Rs. crore	1029	303	732	846	947
Aggregate deposits of scheduled commercial banks	Rs. crore	881	1746	5906	8643	10132
Bank credit	Rs. crore	547	1320	4684	6115	7360
Govt. of India revenue receipts	Rs. crore	406	878	3342	4578	5103
Govt. of India revenue expenditure	Rs. crore	345	826	3179	4592	4955
Govt. of India capital receipts	Rs. crore	106	1156	2524	2974	3482
Govt. of India capital expenditure	Rs. crore	184	1029	2972	3829	4280
Internal debt of Govt. of India	Rs. crore	2833	5783	12708	15958	17439
External debt of Govt. of India	Rs. crore	32	782	6485	7161	5830
Total debt of Govt. of India	Rs. crore	2865	6565	19183	23119	23269
Imports (d)	Rs. crore	650	1122	1634	1827	2636
Exports (d)	Rs. crore	601	642	1535	1961	2411
Net balance of Trade	Rs. crore	-50	-479	-99	+134	-225

- (a) All figures of net national domestic product are taken from the C.S.O. figures on national income. The figure of net product for 1950-51 at 1960-61 prices has been estimated by taking into account the rise in prices between 1950-51 and 1960-61.
- (b) Figures of index number of agricultural production are for the calendar year 1951, 1961, 1971, 1972 & 73 and are taken from the 13th edition of "Indian Agriculture in Brief".
- (c) Figures of placements and applicants on live register of 1972-73 are for the calendar year 1972 and of 1973-74 are for the year 1973 (Jan. to Nov.) and are taken from the Pocket book of Labour Statistics, 1974.
- (d) Figures of imports, exports and net balance of trade are in terms of the rupee before devaluation for 1950-51 and 1960-61 and after devaluation for 1970-71 and after. This is also the same for figures of foreign exchange reserves.

nor taken the country positively in the direction of a genuine socialist society. If one were to view the question superficially and statistically, it does appear that considerable progress has taken place. In actual fact, however, economic growth has been much less than contemplated. At the same time, workers' participation in industry is conspicuous by its absence not only in the private sector but also in the public sector. Cooperative production hardly figures in our agricultural programmes, while equality of opportunity is denied by the low standards of education available to the public at large accompanied simultaneously by high-quality facilities available to those who are in a position to make substantial payment for taking advantage of this facility. There is a great deal of talk and action taken on incentives, but these incentives do not have a foundation in social impulses nor are they designed to appeal to the cooperative and collective in human nature. Our tax system is progressive and aims at reducing inequalities of incomes and wealth, but its effectiveness in doing so has significantly been blunted by tax-avoidance and tax evasion and the comparative failures of governmental measures to overcome these anti-social actions. All this presents

a somewhat dismal picture to a person who takes either the constitutional or the socialist objective of planning seriously. It should present an even more alarming picture to those who have adopted this objective in their party constitution and party ideology.

Why have we drifted into such a position in spite of a one party leadership for so many years, a party which believes in democratic socialism, gave the country's plans a socialist stamp, and spared no pains to insist on the importance of the country moving in the socialist direction?

There are of course many explanations and a great deal of detailed study is required to find an adequate answer to this question. One part of the answer is clear and this is what I want to stress in this brief article. A super-structure has to be built on solid foundations. The building of a socialist society requires certain essential pre-conditions for its implementation within a reasonable period. My feeling is that we have not given adequate attention to these pre-conditions, especially in respect of attitudes and behaviour, class and group relations, and the creation of a climate of socialist psychology. Our attention has been

concentrated far too much on what may broadly be called the material and statistical aspects of socialist development rather than on the human and living factor that give a socialist society its meaning and makes for both its sustenance and maintenance as well as its growth. Two rather prominent examples of what I am saying are found in the way in which we have developed public sector enterprises as well as in the way in which we are formulating and implementing incentives for economic development. Take the first of the two illustrations.

Working of the Public Sector

There is no doubt that the last fifteen years have witnessed a very big advance in the magnitude and diversity of the public sector. Government owns and operates today a much larger part of industry, power, and mines, than it did before the advent of planning. To this has now been added banking and insurance. To this extent there has been a restraint on the growth of private property, private incomes and private economic power. This has not been accompanied however by any radical or fundamental change in the character of industrial enterprise. The public sector enterprises

cannot claim that their workers have a greater attitude of identification with their work than is the case with the private sector enterprises nor can they claim that they have succeeded in releasing the initiative and energies of their workers and made use of their talents in affecting improvements in the working of these enterprises. The public sector enterprise is just an employer as is the case in the private sector. The worker feels neither a special obligation or a special sense of pride or a unique feeling of identification with his work, as should be expected in a socialist society of which public sector enterprises are presumably the most important instrument. At the same time, the public sector enterprises are subject to all the bureaucratic delays and difficulties inherent in a huge governmental machinery with the result that the private sector enterprises are able from time to time to claim that their managerial and entrepreneurial efficiency is greater. If we want to plan for a socialist society and want to use the extension of the public sector as an instrument for this purpose, then it is not enough merely to have a large public sector. It seems more important to determine ways and means of, on the one hand, improving the managerial and entrepreneurial efficiency of the public sector enterprises and, on the other, establishing in these enterprises a psychological climate that will give the workers engaged therein a sense of participation and identification which gives them the feeling of a socialist ownership.

Incentives

The other illustration I would give is about incentives. In a vast and poor country like ours, it is not possible to build up the required quantum either of work or of savings without involving the masses in a positive and purposive kind of way. If mass savings are to be increased and if mass efficiency is to be raised, then the incentives given for development must primarily be motivated towards stimulating in the masses both the desire for putting in more work and setting aside a larger portion of their income resulting therefrom into savings for investment in planned development. *Incentives for the man at the top quite often mean disincentives for the masses at the bottom. Economic development does not take place by percolation in a vast country like ours with its enormous mass of human beings functioning at very low levels*

of income and productivity. The whole strategy has to be to raise the mass base rather than only the class base. Raising the class base is operationally easier and in terms of time perhaps quicker in its results, but the results are not massive enough to meet the problem while simultaneously it might also get offset by the resulting disincentives, dissatisfaction and frustration on the part of the mass base. In the establishment of the socialist order, therefore, incentives have got to be oriented much more in the direction of stimulating mass participation in economic development than has been the case so far in our planning. In order to give content to mass incentives, it is also necessary to change the product-mix of our output of consumer goods and services in the direction of mass consumption goods and give less importance if not eliminate altogether, luxury and semi-luxury goods that cater for the elitist market. Not only is it necessary to increase the output of mass consumption goods to a significant extent, but we must also see that there is a well administered public distribution system that will make these goods available to the masses in reasonable quantities and at reasonable prices.

I must add that neither the transformation of public enterprises in a socialist direction which I have mentioned or the reorientation of economic incentives and the product-mix in the direction of stimulating mass participation can be brought about merely by formal changes or by setting up new institutions. While formal and institutional changes are no doubt required, what is even more important is education, orientation, and psychological transformation that can give meaning and purpose to these formal changes. Thus, for example, we have gone all out to encourage the cooperative movement through special concessions and incentives. This has also resulted in a vast increase in the number of cooperatives and the scale of their operation, but this has not been accompanied either by greater efficiency or by a greater sense of participation or the release of collective energies as is expected from a healthy and functional growth of the cooperative sector as a major instrument for socialist transformation. The result is that while continuing to pay lip-service to cooperatives, realistic considerations of efficiency and economic growth are driving policy makers in the direction of setting up alternative institutions and in calling for other

forms and techniques for bringing in technological progress and increased efficiency. The fundamental question has not been faced as to why it is that the country has not succeeded in creating the psychological preconditions for the successful working of the cooperative principles in our economic activity.

I feel like being driven to the conclusion that the basic element for planning a socialist society is missing in our strategy and techniques. This basic element is mass foundation, mass belief, and mass participation. This foundation can be laid not by economists or technicians but only by political workers and social enthusiasts who have to undertake the vast and back-breaking task of educating both the masses and the classes into the socialist way of life.

Challenge

This is a challenge that faces all parties in the country, who believe in the establishment of a socialist society in India. Capturing the machinery of government is not enough for establishing a socialist society, as is seen by the fact that governmental machinery is and has been over a considerable time in the hands of a party that accepts and believes in the socialist objectives and yet this control of the governmental machinery has not enabled it to move the country significantly in the direction of a socialist society. Government and governmental machinery therefore cannot by themselves bring about a socialist transformation. This has got to be done outside the government and amongst the people in the fields of education, cooperation, panchayats and all the other forms of institutional and group activities, where, both by precept and example, emphasis is laid on the cooperative and socialist way rather than on ways of individualistic and personal aggrandisement. To quote from the Bhubaneswar Congress resolution, "Socialism does not merely signify changes in the economic relations in society. It involves fundamental changes in the social structure, in ways of thinking and in ways of living... This is the vision of a society which the Indian National Congress envisages, wherein poverty, disease, and ignorance shall be eliminated, wherein property and privilege in any form occupy a strictly limited place, wherein all citizens have an equal place, and cohesion, ethical and spiritual values contribute to the enrichment of the individual and the communal life".

If this vision is to be realised and we are planning for this realisation, then the following questions need to be asked and answered:

- (1) Why have our land reforms not succeeded in making significant quantities of land available for distribution and why do they still permit the continuance of such large numbers of tenants and agricultural labourers, such high rents, and so much insecurity of tenure? Why have they not led to the creation of a rural society of either exclusively owner-cultivators or cooperative farms?
- (2) Why are our cooperative societies in such a bad way and why has the principle of cooperation not made a more massive and effective impact on our rural life?
- (3) Why is there the widespread feeling that panchayat raj is encouraging groupism, factionalism, and local bossdom instead of a decentralised democracy giving dignity, equality, and sense of purpose in rural life?
- (4) Why has there been the acknowledged increase in inequalities and concentration of economic power and influence?
- (5) Why is our public life and discussion so much burdened with generalities that lead to no action and not with details that can lead to concrete programmes?
- (6) Why is there such a hiatus in communication and positive cooperation between the leaders and the people?
- (7) Why are our backward regions and backward classes not making more advance either economically or socially?
- (8) Why is our rate of domestic savings and investments so slow?
- (9) Why is there a steady growth in unemployment in spite of economic development and why are we not making a more purposive and more profitable use of our human resources?
- (10) Why is a new elite class growing up without any social passions or a sense of obligation or involvement in mass uplift?
- (11) Why are so many of us in India still superstitious, unscientific, irrational, undisciplined, unmodern, and anti-social in our thought and behaviour?
- (12) When are we going to give our masses a national minimum in consumption levels?
- (13) What has been the influence of foreign aid in aiding or retarding the evaluation of Indian society with the desired socialist pattern?
- (14) Above all, when we so readily get together in the cause of national freedom, why are we not doing the same in regard to the content of national freedom in the terms in which Bhubaneshwar resolution envisaged the future of Indian society?

These are hard questions and can have no easy answering. It is also true that Rome is not built in a day. The question for us is whether Rome is being built at all and, if so, at what pace and with what inbuilt ingredients for further growth, eventual completion, and subsequent continuance. By Rome, of course, I mean not the imperial Rome of old-day Europe, but the socialist society, that we have accepted as our objective.

I believe these are the questions that need discussion and answering. The answers must lead to solutions and the solutions to a follow-up programme. Otherwise, the massive mandate given by the electorate in 1971 will only remain a historic landmark in independent India and will not lead to the creation of an Indian socialist society. □

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PROGRESS OF BANKING AND INSURANCE

It may be said that in regard to both banking and insurance solid foundations have been laid and fairly good progress has been made, not all the credit for which should go to nationalisation. The growth has been by and large an evolutionary process, though in the case of banks, subsequent to nationalisation there has been a marked growth in the establishment of banking offices. The potential that exists for the expansion of banking and life insurance is very considerable in a developing economy like ours and this should be fully exploited.

S.L.N. SIMHA

BANKING and insurance are the two important media for mobilising and channelling the savings of the community. Generally speaking, banks form the most important constituent of the money market and here of course we are talking of commercial and cooperative banks. There are also banks, known as development banks, providing medium and long-term finance for industry and agriculture. Life insurance companies and corporations constitute a very important part of the capital market, providing long-term funds for industry, power development, construction activity, besides subscribing to bond issues by Government and quasi-Governmental agencies. The growth of banking and insurance is an important index of economic development.

In the last 25 years or so, a great deal of progress had been made in India in the fields of banking and life insurance. We may overlook general insurance, which is essentially a way of covering several types of risks rather than a method to mop up savings of the community for promoting investment. Progress has been particularly marked in the last 5-6 years, as regards banking. The period coincides with the nationalisation of 14 major Indian commercial banks in July 1969. Actually, the first instalment of nationalisation of banking occurred in 1955, when the then Imperial Bank of India was

transformed into a public sector institution, under the name of State Bank of India. Several State associated banks became subsidiaries of the State Bank of India, so that by July 1969 not an insignificant portion of Indian commercial banking was already in the public sector. So, today there are 22 public sector banks, accounting for over 80 per cent of the deposits of the commercial banking system.

Life insurance business in India was also nationalised in 1956. In regard to nationalisation, there are two important differences between banking and insurance. In the case of banking, there is a non-nationalised sector, comprising Indian and foreign banks, though this constitutes a minority. Secondly, the nationalised sector of banking does have 22 units, or more correctly 15 units, since the seven subsidiaries of the State Bank of India really constitute, operationally, an integral part of that Bank. In regard to insurances, however, the pattern has been different. We have a giant monolithic institution in the Life Insurance Corporation of India. Even if one were to justify the nationalisation of life insurance, one should have serious doubts about the wisdom of the Government in having merged all the life insurance companies into a single corporation, with all the drawbacks of a monopoly, particularly in so far as efficiency and the safeguarding of policy holders' interests are concerned. It would have been better if Government had retained the identity of the big companies and merged all the units under

public ownership. In that event, the country would have had something like a dozen insurance companies to operate. On and off, thought has been given to breaking up the LIC into separate units on a regional basis but it is now difficult to do anything of the sort. All that can be done is to continue to decentralise the administration of the LIC and ensure that despite its monopoly position, it is sufficiently dynamic to promote the insurance habit in a massive way and use the Life Fund wisely, and equitably, sectorwise and regionwise. This matter would require continued attention of the Government and the vigilance of the Parliament and the public.

It is still arguable whether nationalisation was absolutely necessary in the case of either insurance or banking. Government and the Reserve Bank of India (in the case of banks) had fairly extensive statutory authority not only to regulate the functioning of insurance and banking companies in public interest but also to ensure that they developed into dynamic financial intermediaries.

Be that as it may, let us see how our banking and insurance system has progressed. Even prior to nationalisation, our banking and insurance companies were, by and large, run on sound lines. Failures of banks and insurance companies were few and far between. Actually, one of the factors that would appear to have led to the nationalisation of life insurance was what one might call 'cut throat' competition that de-

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veloped between insurance companies in 1953-55, particularly between the Oriental Company and the New India Company.

Credit Expansion

There has been very large growth in banking from the days of World War II. There was of course a mushroom growth of branches during the War and immediate post-War years but with the coming into force of the Banking Companies Act in 1949 (the statute is now known as Banking Regulation Act), there was marked weeding out of weak units, especially the non-scheduled banks or banks outside the membership of the Reserve Bank. However, the expansion of branches did not gather much pace and even official policy was such as to frown upon any aggressive opening of branches. The view of the authority was that banks should consolidate the enormous gains they had made in the War and post-War years and go about expanding in a modest way.

In the matter of credit expansion too, while there was increasing emphasis on financing manufacturing activity as against trade, the bulk of the credit went to large-scale industrial units and units which formed part of the old managing agency houses and large business houses. Agriculture, small-scale industries and new entrepreneurs did not receive much attention. However, one should say that from 1955 or 1956 onwards, coinciding with the formation of the State Bank of India and also the formulation of a truly ambitious Second Five Year Plan, increasing attention came to be given to the provision of credit to the priority and neglected sectors. In the late 1960's, the pace of both the expansion of banking offices and provision of credit for sectors like agriculture quickened, largely under the stimulus provided by our Five Year Plans and the gradual transformation of Indian agriculture into a modern one. If the experiment of social control had been proceeded with earnestly, this process would have been speeded up.

In the period subsequent to the nationalisation of the major commercial banks, there has been a truly spectacular expansion of banking offices. In the five-year period July 1969-June 1974 the number of offices of commercial banks more than doubled, from 8,321 to 16,936. The largest expansion has taken place in rural branches, which increased from 1860 to 6165. Even in the non-rural areas efforts have been concentrated on establishing branch-

es in places which hitherto were not served by commercial banking offices. Obviously, the mobilisation of deposits through the new offices has not been commensurate with the number of branches opened but this has to be accepted as inevitable and seen in a longer term perspective. Thus, at the end of four years of nationalisation, while the new branches constituted 46.5 per cent of the total number of banking offices in operation, their deposits constituted only 12.1 per cent of the total deposits. But there is no need to be discouraged by this. What is important is that the banking habit is spreading. Incidentally, it should be mentioned that, with a view to encouraging the banking habit, India instituted, as far back as 1962, a system of deposit insurance, the second country in the world to do this.

It is quite true that the substantial increase in aggregate commercial bank deposits that has occurred is to an important extent due to deficit financing of Government. At the same time, there is an increase in the banking habit, which may also be judged by the steady increase in the ratio of bank deposits to total money supply that has been taking place for a number of years now.

In the matter of credit extension too, in the post-nationalisation period there has been a conscious effort to meet the requirements of the hitherto neglected sectors such as agriculture, small-scale industries and exports etc., though it should be noted that this process had begun even prior to nationalisation. It should however be noted that there are also dangers in aggressive extension of credit to these sectors, if the lessons of co-operative credit have to be kept in mind. It would appear that after excessive initial enthusiasm in the matter of credit extension to 'neglected' sectors, there is a more sober approach to the matter now.

Credit Planning

It would not be wholly correct to say that prior to nationalisation, bank lending was mainly security oriented and banks did not bother much about credit planning. However, in recent years there has been a far more conscious effort at credit planning, by the commercial banks under the guidance of the Reserve Bank. The Reserve Bank has set up a Credit Planning Cell and the commercial banks have also been re-orienting their policies in order to channelise credit in a manner that meets the legitimate requirements of all the sectors and at the same time keeping

down inflationary pressures in the economy. Looking at the matter objectively, one cannot help observing that credit planning has not been a conspicuous success. The fact that in the last two years credit extension has been excessive and the Reserve Bank has been forced to take several credit restraint measures, including sharp hikes in Bank rate, is proof that we have made a poor beginning in the matter of credit planning.

The mistake of the authorities has been to rely far too much on direction from the Reserve Bank. Things are changing now and the responsibility is being put increasingly on the commercial banks, which are now trying to recruit proper personnel for credit appraisal such as engineers and financial analysts, though one should say that as in other areas of policy in India, the progress in this sphere has also been slow.

Emphasis of Professionalisation

There is also increasing professionalisation of bank services. Seasoned bankers are being appointed Chairmen and Managing Directors, though one notices a certain amount of parochialism in the matter of top appointments. There is no reason why a Punjabi should necessarily be the Chairman and Managing Director of Punjab National Bank, a Bengali the Chairman of the United Bank of India and South Indians as Chairmen of banks operating predominantly in South India!

Nationalisation has not of course achieved the miracle that was hoped for in the matter of greater involvement of the staff in the work and a marked increase in operational efficiency. Actually, the general impression is that standards of efficiency have fallen. This may well be due to the fact that there has been a much too rapid expansion of banking offices and in this process the quality of staff has declined. However, this may not be the sole explanation. Could it be that bank staff have been treated too well and there is a certain amount of complacency in the matter of work? The bank staff is one of the highest paid in the country with overtime rates being as high as Rs 15-16 per hour. One should hope that there will be a marked improvement in efficiency to match the better emoluments. This is a case where the management of banks, the Reserve Bank, the Government and the representatives of the staff unions must sit together and work constructively. The fact that staff members now sit on the Boards of

Directors of banks makes their responsibility greater than before.

While in terms of deposit resources and credit extension commercial banks constitute the most important segment of the money market, in terms of number and their widespread nature, cooperative credit societies occupy an important place, particularly in the field of rural credit. There are now something like 1.6 lakh primary agricultural credit societies. For several decades the Government has been making efforts to extend the sphere of cooperative credit and there is marked progress since the attainment of Independence. Thus, cooperative credit for agricultural production which accounted for something like 3 per cent of the total borrowings of the cultivators in 1951-52, now stands probably 10-12 times higher, that is to say something like 35 per cent. Total institutional credit for agricultural production is now estimated at something like 50 per cent of the total requirement. This is indeed good performance.

Functioning of Credit Coops

However, the functioning of the cooperative credit system has been far from satisfactory. The standards of efficiency and financial discipline are very low. Overdues are of large dimensions, of the order of 44 per cent for the country as a whole in the case of primary agricultural credit societies. The cooperative system is far too dependent on official support and supervision. In this context, therefore, it is not surprising that the official policy is to bring out a gradual reduction in the number of primary credit societies. Even this progress has been slow!

Meanwhile, the commercial banks are gradually extending their lending for agricultural purposes. Hope lies in this direction. There is no doubt that the role of the cooperative credit system would diminish progressively. One may have to work out an arrangement whereby some of the principles of cooperative system, such as local involvement and an integrated view of rural credit, are combined with the operational efficiency of commercial banks. The Saraiya Commission on Indian banking recommended the establishing of rural banks, sponsored and supported by commercial Banks. There are many snags in this idea but the Commission was wise to suggest, in effect, a gradual departure from the cooperative

system as it has been operating for 6-7 decades now.

Before concluding the section on banking, a reference must be made to large-scale establishment of what are known as development banks, for the purpose of providing medium and long-term credit, underwriting and guarantee facilities for the development of small, medium and large industries. In this regard, India's record is admirable.

Development Banks

Starting with the Industrial Finance Corporation of India in 1948 we have today a number of all-India development banks, with the Industrial Development Bank of India as the apex institution. At the State level there are numerous institutions, in particular the State Financial Corporations. In the last decade, with high rates of taxation and high cost of projects, partly because of larger size and partly because of inflation, the development banks have come to constitute a very important source of funds for industry. Thus, as compared to a total assistance of Rs 71 crore given by the development banks in 1964-65, the amount disbursed in 1973-74 was as much as Rs 274 crore. The assistance of these banks now constitutes something like one-third of the total gross fixed assets formation in the private corporate sector.

The development banks are increasingly becoming developmental agencies, trying to help the economic development of the less developed States and regions and small and new entrepreneurs. Modest beginnings have been made in this direction but in the next decade there should be substantial progress. Development banks are also doing much to raise standards of management of industrial units and act as watchdogs of public interest. They are also assisting the development of Indian technology on the right lines.

Progress of Life Insurance

Let us now turn to the progress of life insurance. On the eve of Independence, life insurance was not much developed in India, this being confined to the urban areas, particularly to the salaried and higher income groups. In the post-Independence period, substantial progress has been made in spreading the insurance habit, though it is still correct to say that the rural sector has not been tapped much to mobilise savings in this form. In considering the progress of life insurance, one

must also take into account the growth of real and money incomes and urbanisation that has been taking place. One must also look at the contribution of insurance to the saving pool of the community in relation to other sources of saving. Looked at from all these angles one should say that the progress of life insurance has been good but not good enough. The number of life insurance policies in force in India recorded a rise from 54 lakh at the end of 1957 to 168 lakh at the end of March 1973. Expressed as a percentage of population, there was a rise from something like 1.3 per cent to slightly under 3 per cent. The increase in regard to life insurance sum assured (including bonuses) recorded a sharper rise, from Rs 1374 crore to Rs 9204 crore, during this period. According to press reports, the aggregate life insurance sum in force recorded a substantial increase to Rs 10,849 crore at the end of March 1974.

As a proportion of gross saving of the household sector in financial assets, insurance has on the whole shown a rise in the post-nationalisation period. There have of course been ups and downs. Thus, from a level of 5.7 per cent in 1956-57, insurance as a proportion of gross household saving in financial assets recorded a rise to 13.9 per cent in 1968-69. Since then there has been a steady decline, the figure for 1973-74 being 9.7 per cent. Apparently, inflation is at least partly responsible for the decline.

The investment of life insurance funds is fairly rigidly controlled by the provisions of the LIC Act and the directions given by the Government to the LIC from time to time. Broadly speaking, investment in Governmental and quasi-Governmental securities and loans constitutes about 75 per cent of the LIC's investments, the rest being in private sector companies and institutions. Over the years, investment in Government securities proper has declined and now there is greater investment in the bonds of quasi-Governmental institutions and grant of loans to State Governments and Governmental agencies for construction of houses. Naturally, the LIC is making efforts to spread its investments on as wide a geographical basis as possible. The LIC has an Investment Committee to attend to the broad investment of its funds within the four corners of the statutory requirements and policy guidelines given by Government. The LIC has built up a fairly good investment Department. In 1957-58 the

LIC was involved in an enquiry arising from the investment of some of its funds in Mundhra companies. But for this episode, one should say that by and large there has not been much of complaint about the investment of LIC's funds. Sometime back an official committee headed by the Governor of the Reserve Bank studied the question of LIC's investment policy and made a report, following which the Government recently issued some guidelines to the LIC. Space bars any detailed discussion of this matter.

Policy-holder's Interests

The one serious comment that needs to be made is that the policy holder's interests have been adversely affected by two factors, namely, low interest rates offered on Government and quasi-Government bonds and high rate of inflation. The LIC is a captive investor in Government and semi-Government securities. This matter ought to be viewed with proper concern by the authorities and something done to minimise the erosion of the value of a life policy.

The LIC's working was also reviewed some years back by a working group of the Administrative Reforms Commission. One does not know to what extent the ARC's recommendations were accepted. While the LIC naturally suffers from the usual defects of a giant monopoly and bureaucracy, the general impression which one has is that it has not done too badly. However, where it has to show much greater progress is in the matter of spreading the life insurance habit, particularly in the

rural areas and among small income groups. The time has also come for the Government to consider seriously whether, as in the case of provident fund, life insurance should not be made compulsory for large sections of the working community. Some of the erstwhile Princely States like Mysore had a system of compulsory life insurance for confirmed Government employees.

A word or two may be said about the management of the LIC. Nearly all the Chairmen have come from outside but otherwise the rule seems to be promotion by seniority from within, with hardly any new blood at the senior levels, where the actuaries still seem to dominate. This matter needs to be reviewed. Also, the LIC, like many other public sector organisations, has suffered from the bane of too many changes at the top. In the 17 years of its functioning, the LIC has had nine Chairmen, on an average a tenure of less than two years per incumbent. There must be a policy of a minimum of five years, so that the person understands the problems and is able to contribute something to furthering the objectives of the LIC.

The nationalised banks and the nationalised LIC have to guard themselves against excessive governmental regulation and they should also be alert about political pressures whether from the Central Government or the State Governments, in the matter of disposition of their funds. Some way should be found to impart a spirit of competition into the LIC.

So far, we have said nothing about the premier institution of the money and capital markets in India, namely, the Reserve Bank of India, India's Central Bank. The Bank has been in existence for about four decades now and it may be said that it has functioned fairly well, particularly in regard to its promotional role in the building up of an adequate institutional machinery for promoting economic development. While the Bank has been functioning broadly on the right lines, an expert examination of its functioning and set-up is overdue, so that it may contribute in an even larger measure to promoting economic development with stability. The Reserve Bank's record in the matter of achieving price stability has so far been very disappointing, though a good part of the blame for this rests on the Government, which turns to the Reserve Bank all too freely for financial accommodation.

Finally, it would appear that there should be a national forum for discussing problems of the money and capital markets. For this purpose the Government should revive the National Credit Council, with such change in its construction and functions as may be necessary. The Council was set up in 1967 as part of the experiment of social control over banking but it was one of the casualties of the nationalisation of 14 major commercial banks in 1969. It would be very useful to revive that body so that our financial machinery can be made to do a good job of promoting growth, balanced regional development and operational efficiency. □

INVESTMENTS IN INDIA - PUBLIC AND PRIVATE SECTORS UNDER THE FIVE YEAR PLANS

(Rs Crores)

Plan	at current prices			Cost of investment in India	at 1974-75 prices		
	Public Sector	Private Sector	Total		Public Sector	Private Sector	Total
First Plan	1460	1900	3360	337.6	4929	6414	11343
Second Plan	3450	3300	6750	284.3	9808	9382	19190
Third Plan	7200	4732	11932	243.0	17496	11499	28995
Annual Plan 1966-69	5678	4027	9705	174.3	9897	7019	16916
Fourth Plan	13954	8980	22934	143.7	20052	12904	32956
Fifth Plan	31400	16161	47561	100.0 (135.7)	31400 (42610)	16161 (21930)	47561 (64540)
Total	63142	39100	102242		93582 (104792)	63379 (69148)	156961 (173940)

Note: Since the Draft Fifth Plan estimates were worked out at 1972-73 prices, figures in brackets indicate estimates at 1974-75 prices.

HEAVY INDUSTRIES

Sinews of our Economy

T. A. PAI

Building a base for heavy industries was part of our dream even before Independence, and our First Five Year Plan defined the broad policy for action. It was not an easy path that India chose, because we tried to do what other highly industrialised countries had done over a century or more. It required large investments of money without commensurate return in the very short run. It called for massive State initiative and financing. It meant, also, dividing our limited resources between agriculture and industry when we were desperately short in food grain output. We were heavily dependent on import of machinery, plant and technical know-how. We had to pass through several years of poor returns after installing heavy industries.

India has braved most of these difficulties. We have made initial mistakes particularly by way of underutilisation of plant and machinery and this came in for just criticism. We have now crossed the hump by reorganising management of these industries. In several fields we are even able to export our technical know-how. There is now a clearer picture of what we need to do in the next decade and what we can do. We have an ambitious programme to create research and development facilities which will be implemented during the Fifth Plan and, where necessary, resources will be provided to manufacture prototypes based on indigenous designs.

The crucial role of heavy industries in development of the entire economy received close attention from our national leadership even before Independence. The National Planning Committee which was set up by the All-India Congress Committee considered the role of this sector of industry in considerable depth and had in fact formulated a broad plan of action before the Fifth Five Year Plan was formulated. The machine building industry which has come to be synonymous with heavy industries, received considerable attention in different forums. Subsequently, the Five Year Plans have, within the limitations of availability of resources, tried to give reality to the vision of our nation builders in the pre-independence era.

Heavy industry encompasses not only the heavy machine building industry which covers manufacture of machinery and plant for steel plants, mining industry, power and fertilizer plants but also manufacture of machine tools, tractors, automobiles and heavy structural fabrication. This sector of economy can, therefore, be described as the core of the core industries.

From its very nature, it is obvious

that this sector of industry requires a large capital base and in the initial years, returns may not be always commensurate with the normally accepted standards of return on capital. On account of the large capital required to set them up, it was not considered possible for the private sector to make any significant contribution to its development. Besides, on account of the critical nature of the huge development programmes envisaged for the metallurgical and chemical industries as well as power plants, it was necessary that the sector providing equipment for these industries and which would inevitably assume a crucial role in any scheme for self-reliance, would have to be in the public sector. This alone, it was felt, would enable it to assume its proper role and stature in the economic structure of the country.

The Heavy Engineering Corporation was conceived as the focal point for development of heavy machine building industry in the country and incorporates a Foundry and Forge Plant capable of producing castings and forgings upto 100 tonnes of weight, a Heavy Machine Building Plant to produce finished

equipment for steel plants and a Heavy Machine Tools Plant to undertake manufacture of large machine tools of capacities higher than was possible in the traditional machine tool industry. The machine tool industry itself got a tremendous fillip by the setting up of the Hindustan Machine Tools, which have gone from strength to strength and are making a significant contribution to the national economy by not only producing machine tools of a very wide range in its various plants but also tractors and watches. That the products of HMT can compare with the best in the world is under scored by the fact that their machine tools are accepted the world over on equal terms with those from developed countries. The HMT have, therefore, been able to build up a fairly large sized export base. In fact, they have reached a stage when they are exporting Indian technology for manufacture of machine tools to other countries. The Bharat Heavy Electricals Ltd., have perhaps made most striking contribution to self-reliance in the national economy. We have come a long way off from the time when entire power plants were imported to the stage that no

only is BHEL in a position to meet the requirements of the country for the Fifth Five Year Plan but has been able to set up and commission a power plant in Malaysia and is now undertaking setting up of one of the biggest power plants in Iran. The initial inertia cast perhaps by lack of detailed thought to linkages between different sectors of industry, which in earlier plans caused under-utilisation of available capacity in the heavy machine building industry, is now a matter of the past and one only has to go to these plants now to see the impressive hum activity that is apparent almost round the clock.

Inevitably in the earlier Plans there was heavy dependence on import of machinery and plant. A typical case is that of our steel plants. In the case of Bhilai Steel Plant, in its first phase, 86 per cent of machinery and plant was imported. Thanks to the huge strides made by the machine building industry and in particular the Heavy Engineering Corporation at Ranchi, for the 4 million tonnes expansion phase of Bokaro Steel Plant the situation has been completely reversed inasmuch as 86 per cent of the equipment required for this phase was and is being made indigenously.

The bane of heavy industries, criticised both in the Parliament and in the public, was the gross under-utilisation of machinery and plant. This criticism was justified. In many cases, this happened because of lack of adequate planning in the sectors consuming their products. While on the one hand there were massive plants installed at huge cost to the exchequer lying unutilised, on the other, we were resorting to massive imports of products which these very plants were able to turn out. By and large this situation has been overcome and utilisation of machinery and plant in the public sector is now at almost internationally accepted standards. In the Department of Heavy Industry itself, in view of the critical importance of this aspect, a very close watch is kept on it with the help of an information system installed soon after the erstwhile Ministry of Heavy Industry was formed.

Fifth Plan Strategy

The strategy being followed for the development of heavy industry in the Fifth Plan is to attack the problem from several different directions:

- (i) Speedy completion of Projects already under implementation;
- (ii) Programmes for removal of

imbalances in the units with a view to improving their capacity utilisation;

- (iii) Rehabilitation of units taken over by the Government;
- (iv) Major sick and closed engineering units under the private sector proposed to be taken over;
- (v) Rationalisation of the product-mix of the existing units and expanding their capacity;
- (vi) Creation of new units, where necessary, to meet the Fifth Plan requirements; and
- (vii) Assistance to the private sector units falling under the category of heavy industry to optimise utilisation of their capital assets.

Depending on the specification and type of equipment, the time between availability in the market of materials like steel and fertilizers, and the design of equipment to put up massive and giant plants to produce them, requires in many cases, 5 to 7 years. This inevitably involves very detailed planning of the huge infrastructure of manpower, machinery and plant and other resources that are required to produce that equipment. In order to ensure that last minute hold-ups in supply of machinery and plant do not result in avoidable imports, forward and backward linkages for the machine building industry have to be carefully conceived, meticulously planned and effectively implemented.

Passage to self-reliance

The country has been largely dependent till very recently on foreign sources for technology and designs. In a number of cases, even though equipment has been manufactured in the country, it was to imported designs and conforming to foreign technology, adapted, of course, to meet local conditions. This is an inevitable phase in any developing economy. Many developing countries have had to face the problem of this phase becoming unduly long on account of complacency caused by ready availability of designs from other countries. Fortunately, in the heavy machine building industry in India, this trend has been arrested and all the plants have not only set up large design organisations but have also taken various steps to step up their R&D activities so that the entire industry in this sector can, to a very large extent, stand on its own feet. The Ministry of Heavy Industry, along with the National Committee on Science and Technology and the Planning Commission has drawn,

up an ambitious plan for the development of research and development facilities in this sector during the Fifth Plan. This programme includes an Institution for Steel Plant Equipment, a National Boiler Institute, a Research and Development Institute for Heavy Electricals, development of facilities for machine tool designs, a new set up for design of mining and washery equipment and a Welding Research Institute, in addition to design offices which will be developed as adjuncts to most public sector manufacturing enterprises. Where necessary, resources will be provided to manufacture prototypes so that designs made in offices can be converted into full scale equipment and put to test.

Private Sector not Overlooked

While all the attention is being paid to the public sector industries, we are also taking action to ensure that the private sector machine building industry also utilises its capacity optimally and plays its proper role in the mainstream of national economy. Imbalances in their capacity are being removed and I have no doubt that almost the entire equipment required for the Fifth Plan expansion schemes in the core sector will come from within the country.

As mentioned earlier, the heavy industries require relatively longer time for development of capacities and their infrastructure. With this background, we have already given thought to capital requirements in the Sixth and the Seventh Plans and, in fact, the physical capacity that will be created for additional machine building output during the Fifth Plan will really come in handy for steel, fertilizer and other plants to be completed in the Sixth and the Seventh Plans. A careful analysis of the demands of the user industries over the next few years has already been made and, as is inevitable, these are being updated at regular intervals taking into account the pace and progress of the Fifth Plan including actual achievement of targets by user industries. The heavy industries sector in the country has to face tremendous challenges in the time to come and I am sure that with the effort, initiative and drive that has been and is being displayed in this crucial sector of economy, it will successfully and effectively meet them. □

Shri Pai is Minister of Heavy Industries and Civil Supplies, Government of India.

25 YEARS OF INDUSTRIAL DEVELOPMENT

I feel like an ageing father who feels that his son has not done so badly after all, but could have done better. The Public Sector has not come up to expectations. If we have to progress faster we must expand our productive base, increase our productivity and reduce costs.

S. L. KIRLOSKAR

WHEN I look at the industrial development of our country in the last 25 years, I feel like a father who in his advanced years thinks that his son has not done badly after all, but could definitely have done better. There are indeed many achievements to our credit and equally, we have also to our debit many missed opportunities. Along the path of our development we have deviated at several places, indulged sometimes in day-dreams, and have caused waste of manpower, money and time.

How one can assess the growth and development of a vast country like India would depend on the quality of the test one applies. I would prefer to employ the tool of logical scrutiny even while assessing the records of our economic activities. Striking a rather personal note as a man who has been managing industrial enterprises almost 25 years before our Independence and an equal period thereafter, I would prefer to assess this record in practical terms, that is, how effectively we have made productive use of men, money and time and whether what we have achieved measures up to the cost incurred and the means we have employed.

A Sound Base has been Built

We have now a variety of industries which we never had before. In Machine Building Industry, with which I am closely associated, we have enough in knowledge, technical expertise and experience to rate India high in the industrial world. A few months ago I assured businessmen in the EEC area that we, in India, can cast, forge, fabricate, or

machine anything they want and at less cost. I told them that India has the ability and know-how to manage nuclear plants, International Airlines or produce any intermediate or finished products. And I was not exaggerating. We have the ability to convert our iron-ore into steel and make many things, from locomotives, machine-tools, tanks and adapt, innovate and operate any technology. We use the most modern machines and tools along with our ancient tools and methods, depending on whichever is more useful and economical.

We are endowed with abundant manpower which many free countries lack. Indian industrial plants are modern and equal to any in the industrially advanced countries. In short, we have built a strong and stable industrial base.

Our ability and know-how is deeply rooted in our soil and our men can perform anything required of them. We are selling more and more engineering products to the developed and developing countries. Our exports of intermediates and finished products are increasing. We are steadily winning friends in developed countries, who accept Indian products as equal in quality and performance to those produced in developed countries.

These are broadly our achievements in the last 25 years.

Checking on the path of our industrial progress I find that the progress has been uneven. We established our Planning Commission in 1950. The first Five Year Plan was launched in 1951. It took into consideration the stock of the situation as it existed and sought to speed up the growth rate. We, in

business, got busy modernising our plants and establishing new ones to meet the welcome challenge of rising demands on the part of our emerging people who had found a new-born sense of pride as a nation.

When the First Plan was initiated, Indian entrepreneurs and political leaders were hardly separable. Both had fought together to win political freedom. Businessmen had to fight on both the fronts, political as well as economic. The pre-Second World War decades (1890 to 1939) had been hardly helpful to Indian business interests.

Our entrepreneurs had to fight the apathy and indifference in our society as much as they had to contend with the hospitality of the colonial rulers. Lokamanya Tilak bitterly criticised our social indifference saying, that while we (Indians) discussed how we could achieve Nirvana, our industrialised ruler controlled both our freedom and our markets. He inspired his countrymen to action with the clarion call of Swadeshi. His thesis was: 'if we manufacture what we need we can save our money from going to strengthen British manufacturers'.

The Patriotic Urge

This stirring message did not fall on deaf ears. Many enterprising men started industries on a modest scale and came to compete with British, German and Japanese goods which then flooded our markets. If I may be pardoned for illustrating this new urge with another personal note, my father, Laxmanrao Kirloskar (1859-1956) was among the pioneers who, despite the many challenges that came their way, proved to be tough and obstinate entrepreneurs. He produced iron

ALLURING "JAYA" "RATNA" AND "SONA" EXCEL

Surplus in foodgrains, Andhra Pradesh is often lauded as the "RICE BOWL" of the South. The State is surplus in the production of sugarcane, tobacco, oilseeds, chillies etc. The productivity of rice in the State is among the highest in India.

Sustained efforts have been made by the Department of Agriculture in particular to popularise high yielding varieties of rice since 1966-67. With the result, the acreage has been on the increase year after year.

High-yielding varieties like "JAYA", "SONA", "RATNA", "JAGANNATH" RP-193 etc. have been become, of late, very popular. They covered an area of 18.11 lakh hectares (45.27 lakh acres) during 1973-74, as against 9.88 lakh hectares (24.70 lakh acres) during the preceding year. This two-fold increase in acreage is a significant pointer to the success of high yielding varieties.

The ambitious target for the current year is 20 lakh hectares (50.000 lakh acres).

The rice production in the State touched a new high of 53.52 lakh tonnes in 1973-74, compared to the 42.56 lakh tonnes during the preceding year.

Perhaps, in one respect, the Department of Agriculture deserves all kudos. Its seed distribution of high-yielding varieties during 1973-74 stood at 10,300 tonnes, claimed to be record figure among the Southern States.

Let us grow two blades of corn where one grew before.

The Department of Information & Public Relations,
Government of Andhra Pradesh

ploughs and plough-shares that successfully competed with similar British-made products. It was a fight which he had to win or lose by competing both on cost and quality of his products. He won. In the process he established direct, personal contacts with farmers which enriched his experience and enlarged his vision. This has been an invaluable heritage to the industry.

The experience in other fields of industry was not very different. Managers of textile mills in Bombay and Ahmedabad had to contend with competition from Manchester and Japan. The Bhadravati Iron and Steel Works in Karnataka, a public sector enterprise from the beginning faced the same challenge with disheartening consequences. It is interesting to recall that my father once had to buy a large quantity of its products to enable Bhadravati to survive. This transaction proved to be both a sound business proposition and an act of patriotism.

In competing with foreign enterprises, men like Walchand Hirachand often out-bade, out-worked and out-financed many of their foreign competitors to prove that Indian businessmen could hold their own. Hirachand established our automobile, ship-building and aircraft industries. The Government later took over the last two. Many such examples illuminate the pages of modern Indian history.

The Dividends of Early Enterprises

All these early enterprises, doggedly pursued through challenges and tribulations, brought their harvest of economic reward during the Second World War. While most of Europe, the Middle-East and the whole of South East Asia suffered destruction, India continued to be an island of industrial activity. Indian enterprises worked round-the-clock and produced things which they had never produced before and in volumes they never had imagined would be possible. Kirloskars established the first machine tools factory, to manufacture exclusively machine tools in 1940. There was no foreign collaboration, and no technical experts from any of the advanced countries. War effort suffered because India was still not in a position to make machine tools and none could be imported from anywhere in the heat of the war. We made the lathes as best as we could and laid the foundation of India's Machine Tools Industry.

During the War, the British paid for Indian materials in pounds sterling. On our Independence Day, along with our entrepreneurial ability the industries had built a large Sterling Balance in U.K., which helped the Government of Independent India to build the country on new lines. The First Five Year Plan derived much of its strength from this infrastructure and the Sterling Balances. We thus put ourselves firmly on the path of self-development and the new era of freedom had dawned.

Planning and After

Since the First Plan, major shifts have occurred in Government policies. We have of late been trying to do everything for everybody. The concepts of social needs and 'social purpose' have gradually taken over the definition of governmental policies. The new trend became manifest in the Second Five Year Plan and has continued ever since with its natural impact on production and expansion of economic activities. Our economic planning has now been married to political ideas and the result has been that the Government has come to restrain rather than encourage enterprises and production. As a result our Third, Annual and the Fourth Plans have shown a poor record of performance in spite of heavy inputs. We paid and continue to pay a very high cost through the public sector which logically should have a normal productive role in our economy. Because of their faulty economic base, the large public sector units do not have sufficient economic strength to occupy a commanding position in our economy. On the other hand, they have become a drag on it.

The logic of economics does not respect political ideologies. Our economic growth-rate never reached the set targets, the average being about 3.5 per cent when 5 to 5.5 per cent were expected and investments made accordingly.

Infrastructure Neglected

We have put Rs 55,000 crore into the public sector and have been continuously paying for the losses incurred by these industries. Many public sector enterprises and government-run or aided educational institutions are forced to buy public sector engineering products at prices far higher than prevailing market prices.

Meanwhile, we have neglected to

strengthen the infrastructure of our economy by providing adequate power generation, irrigation, road building, communication, farm development etc. This is rather tragic. Most of the inputs for our industrial and agricultural production originate in public sector monopolies which have failed to deliver the goods in sufficient quantities.

The net result is that while we have a large and varied base for our industrial production, our productivity and productivity have begun to suffer badly. For example, Hindustan Steel spends more money to make less steel compared to Japanese steel enterprises, though we have all the ore and coal in our country and Japan has to import them.

Our agricultural production does not rise beyond 2 to 3 per cent, and often the growth rate falls below zero. Our farming operations are caught in shortages of power, fertilisers, fuels, and lack of irrigation. Farm mechanisation will turn out to be a joke if the average size of our farms shrinks to an uneconomical size, as in fact it has. No doubt we can quote figures to prove that we now produce so much more steel or electric motors and so on. This I have refrained from doing because our industries have matured. The progress we have made in industrial production is creditable in any measure if the size of our ventures, and our capability are considered.

Guidelines for Future

To progress further, our economy must develop faster and in diverse directions to keep our productive base alive and expanding. Our productivity must go up and our costs must be kept at a reasonable level. These are economic functions that can be performed only in the context of economic disciplines.

Most of the ills from which the world economy now suffers are almost the same from which we are suffering. In democracies, politicians tend to promise to the electorate more than they can accomplish with the result that the country's economy loses. We have to re-think and re-plan our directions of economic development. To get the most out of our sound productive base and achieve faster progress in every direction, we have to follow economic disciplines. Economic logic does not respect political ideologies or national flags.

A massive effort for a massive challenge with a crucial role to play in the nation's commitment to social change.

The CSIR and Scientific Research

With Independence also came the enormous problem of telescoping the technological achievements made by the advanced countries into two or three decades. As this called for a massive effort the Government had to take the lead. Hence the chain of 34 National Laboratories and Research Associations spread all over the country which could train our scientists and provide the benefits of R & D to our industries. With the adoption of the Science Policy Resolution in 1958, scientific research received a sense of direction but soon it became clear that the ossified hierarchical system of management failed to meet the current demands and challenges. The CSIR has therefore been subsequently reorganised with a compact Governing Body.

The research laboratories are now contributing to various facets of the R & D spectrum and the current emphasis is on mission-oriented research whose impact will be felt by industries engaged in creating wealth.

Y. NAYUDAMMA and R. N. BHARGAVA

AS Independence dawned, the nation had the enormous task of telescoping the technological achievements of the developed nations within a breathlessly short period. The effects of contemporary scientific and technological revolution upon industrial and economic activities as evidenced in the West had great significance for us and they had to be kept in mind while drawing up our policy framework. The national leadership was fully alive to the implications and potentialities of scientific research and development. Jawaharlal Nehru, India's Prime Minister at the time observed: "I see no way out of the

vicious circle of poverty except by utilising the new sources of power which science has placed at our disposal". He firmly believed that "the future belongs to science and to those who make friends with science."

Before Independence, activities in the fields of Agriculture and Medical Research had been already organised under formal agencies. A few other scientific institutions in certain specific fields had also been established. Most of the academic institutions and universities were also active partners in fostering R&D culture and contributed to training specialist manpower in a variety of scientific and technological fields. Thanks to the vision of Shri A. Ramaswamy Mudaliar, a department of science was created in 1940 and subsequently

the Council of Scientific and Industrial Research was constituted by the Government in 1942. Promotion, guidance and coordination of scientific and industrial research in India and the utilisation of results of research towards the development of industries in the country were among the main aims of the Council. The report of Prof. A.V. Hill in 1945 had helped to concretise the pattern of organisation of scientific research. This gave fillip to the plan of establishing a chain of national laboratories to conduct research in the areas of fuel, glass, physics, chemistry and metallurgy. Research in many other areas like food processing, ship design, aeronautics, radio, buildings, road construction, engineering and other subjects were suggested at that time.

Growth of CSIR and R&D Culture

During the first decade of Independence CSIR had emerged as the major R&D agency in the industrial sector. Eighteen national laboratories were established under it representing different disciplines. It was expected that these laboratories once set up would interact with the community, awaken the industry to the needs of R&D, generate the necessary infrastructure and train scientists and technologists in different industrial fields to tackle the problems of growing industry. This was mainly an exercise in building technology competence. In the absence of adequate interaction between industry and industry the trained scientists fostered a monastic environment, free thinking and publication-oriented research. An event of far-reaching importance in this period was the adoption of the Science Policy Resolution by the Government in 1958. It recognised in unambiguous terms the need to foster and sustain research efforts at the national level and envisaged the creation of a proper temper and environment in which creative thinking could thrive. This had its impact on R&D culture in the country and the aspirations of the scientific community were met to a certain extent.

In the sixties scientific research and expectations from these came to be more clearly defined and the national laboratories oriented their strategies to meet the new challenges. The rigid, discipline-oriented organisation of research was in a ferment and inter-disciplinary research was being undertaken by the teams of scientists/technologists/engineers to solve industrial problems. It became clear with expertise that the ossified

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hierarchical system of management failed to meet the current demands and so new patterns were introduced irrespective of the seniority or status of scientists heading research projects.

The CSIR was subsequently reorganised in the early seventies and it now presents a more coherent picture, capable of contributing effectively to the national R&D effort. The R&D culture based on modern management techniques has been introduced in the recent past.

A compact Governing Body has now been constituted which meets frequently. A decentralised, internalised collegiate management system has been introduced at the level of both the Governing Body of the CSIR and the Executive Committees of the constituent laboratories. The Headquarters of CSIR has been restructured, laying greater emphasis on its technical components namely, research planning, technology utilisation, technical manpower, extramural research and international collaboration in science and technology.

As against the two national laboratories in 1947 the Council currently supports 34 national laboratories/establishments besides 11 Industrial Research Associations.

The financial resources of the CSIR are mainly derived from the annual grants made by the Union Government. During 1942-43 its total grant was Rs 11 lakh. It has steadily increased over the years and in 1973-74 the total revised budget was Rs 285.4 lakh. This works out to over twentyfive fold increase in about 30 years.

The Council had on its rolls in 1950-51 less than 400 scientific and technical personnel and in 1973 it rose to 10,912 with a total staff strength at 13,792.

Extra-mural Support for R & D

The Council supports extra-mural research in the country and provides substantial grants-in-aid to encourage development of research talent and augment research potential and facilities at various academic and industrial research centres. In 1942-43 such grants-in-aid amounted to less than Rs 3 lakh, whereas it was around Rs 160 lakh in 1973. It currently supports 495 research schemes and has awarded 4039 research fellowships at senior and junior levels.

The Council also administers a scientists pool which was established in 1958 with the specific purpose of providing temporary employment to highly qualified scientific and technical personnel. There is no upper limit for the number of

scientists to be employed in this scheme. A total of 9852 scientists were selected for placement under the pool till the end of 1973.

Incentives for Technology Transfer

The research laboratories have been contributing to various facets of R&D spectrum and the current emphasis is on mission oriented research which could be applied to generate wealth in the country. A new scheme is envisaged under which scientists and technologists interested in entrepreneurial activity through industrial exploitation of R&D processes/products are allowed regular leave from the laboratory. This is meant to encourage research workers to participate in the industrial revolution and contribute to national development.

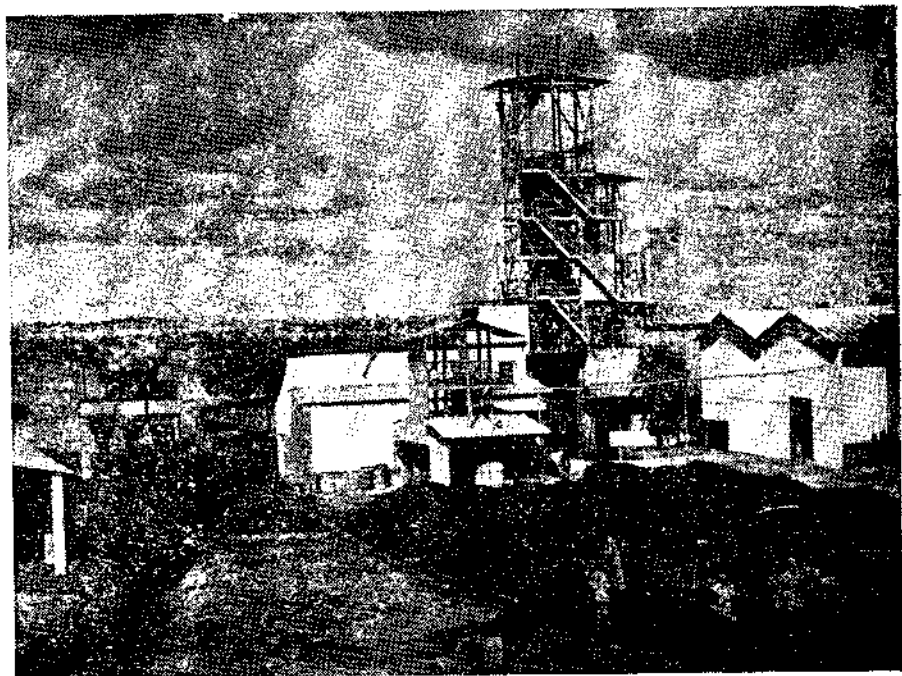
The publication activity of the CSIR has also been very encouraging. In 1973 alone the total number of research papers published was 1272 from all the laboratories. The publications and periodicals brought out numbered 57 from all the establishments put together. The CSIR had released 41 processes to the industry in 1958-59 (including those released free of charge) based on R&D work conducted in various laboratories. In 1973, however, the number of processes released has gone up to 102 and those utilised by the industry in this year number 38. There were about 282 processes in production in 1973 in various industries based on CSIR's R&D efforts. The total number of patents filed in India in 1973 by the CSIR was 142.

Technical assistance to industry has also been provided in an increasing measure. This is broadly of three types, namely, technical information, design engineering consultancy and analysis and testing. The organisation is also contributing to various public sector enterprises and government departments by lending its expertise and acting as consultants.

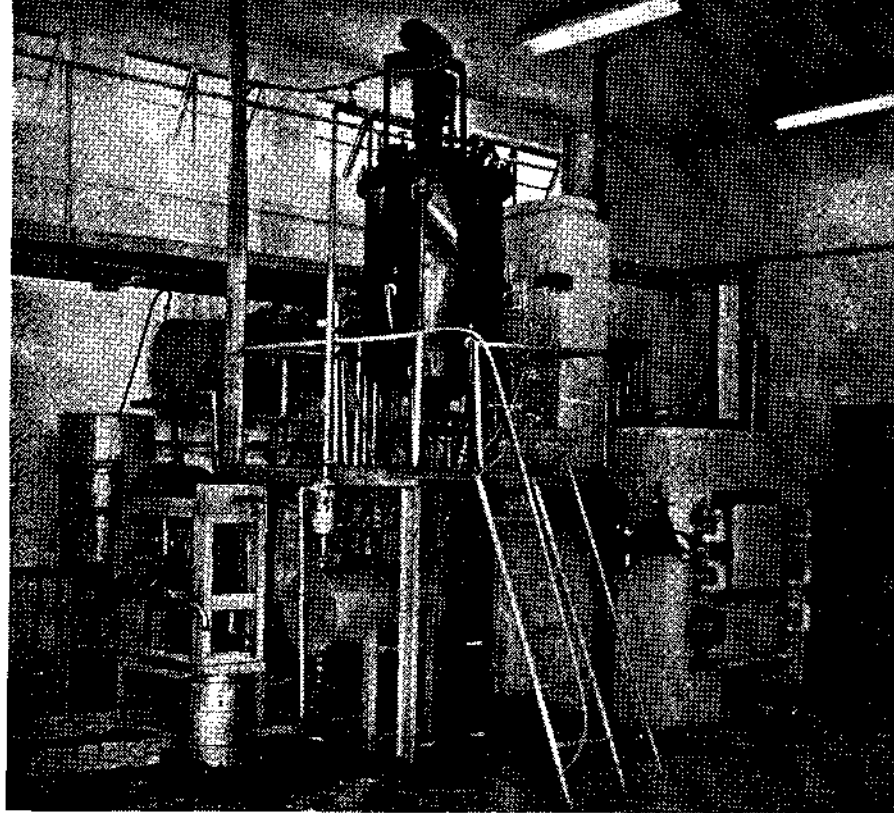
At international level, several laboratories are providing technical assistance to various developing countries in different areas. For instance, the Central Leather Research Institute is assisting, through the FAO, Iran in establishing the Iran Leather Institute. The Structural Engineering Research Centre is assisting Iraq to set up a Building Research Centre. Under UNIDO-CSIR agreement a number of requests from different countries in the area of technology transfer are being processed. Delegations from a few countries, e.g. Fiji, Republic of Korea etc. have visited India and some technology transfer agreements are on the anvil. As a follow-up of the recommendations of the second meeting of the International Commission on Science Policy Studies and the Summer School, along with the nucleus for the centre for Science, Technology and Development, a Cell for Science Policy Studies is added in order to serve a number of developing countries.

Some of the major achievements in various sectors are discussed in the following:

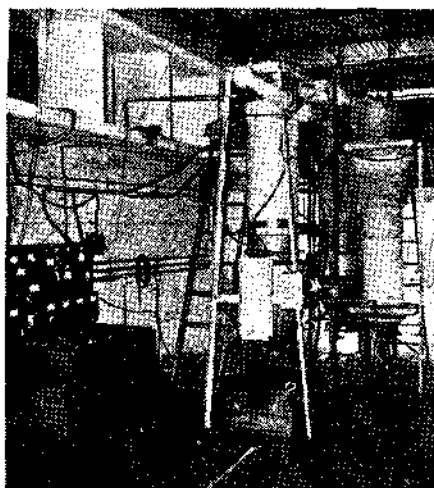
Central Food Technological Research Institute has developed indi-



Low temperature Coal Carbonization Plant. Capacity: 25 tonnes a day.

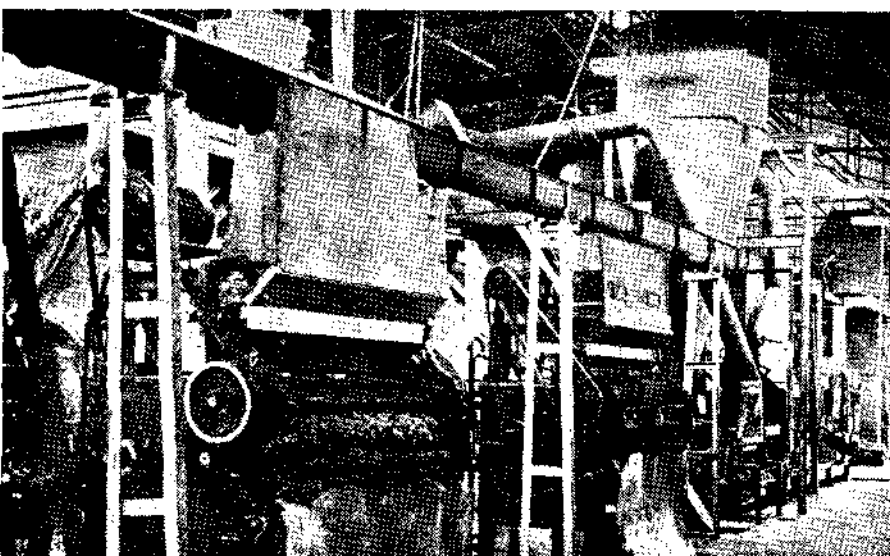


Above: Reclamation plant of used lubricating oils—pilot plant set up by the Indian Institute of Petroleum, Dehra Dun.



Left: Pilot Plant for Hexachloroethane

Below: Cottonseed Processing Plant, RRL, Hyderabad



genous baby food from buffalo milk and also a toned animal milk product 'Miltone' partly based on groundnut protein isolate. These are under commercial exploitation. It has developed antifungal pastes and has contributed to the technology of banana preservation for export purposes. A protein isolate plant with groundnut as raw material has been designed and fabricated.

The plant based laboratories of CSIR have made useful contribution and have introduced several varieties of medicinal and other plants in the country. The cultivation and improvement in the existing varieties of discorea, mentha citroneHa and lemongrass etc. have been undertaken so that the need for import of some of the items has been completely obviated.

Processes for synthetic production of drug ephedrene have been worked out by the Central Drug Research Institute. Several other drugs e.g. theophylline, clofibrate, vitamin B6, Vitamin C etc. have also been developed.

The know-how and process developed by the National Chemical Laboratory include the manufacture of acetanilide, β -ionone, Nicotine sulphate, water dispersible DDT, Vitamin C etc. Besides, several other chemicals have been released to the industry and are being successfully produced. Sodium azide which is used in the manufacture of explosives and detonators is being indigenously produced to meet the entire requirements of Defence based on the know-how developed by the Regional Research Laboratory, Hyderabad. Process for producing certain other inorganic chemicals e.g. silicon carbide (abrasive grade) activated Fullers earth etc. have been contributed by this laboratory.

The Indian Institute of Petroleum has operational linkages with the Indian Oil Corporation, various oil refineries and with the Ministry of Petroleum. It has developed hydrodesulphurisation process for desulphurisation of distillate fuels. A highly effective alkyl pitrate type additive for improving the octane number of diesel fuels has been evolved. The know-how has been found for the preparation of liquid paraffin from indigenous raw materials.

Processes for carbon electrodes for air depolarised cells has been developed in Central Electro-chemical Engineering Research Institute. These are required on a large scale by railways and now all the demands

are being met from home production. It has also developed processes for the production of potassium chlorate, calcium tungstate, blue phosphor and manganese dioxide from manganese chloride solution.

A four feet trisomic wind tunnel has been established at the National Aeronautical Laboratory, Bangalore. This has helped the design and testing of the various configurations of an advance technology aircraft being designed by the Hindustan Aeronautics Ltd. Rocket models are also being tested and perfected making use of this facility.

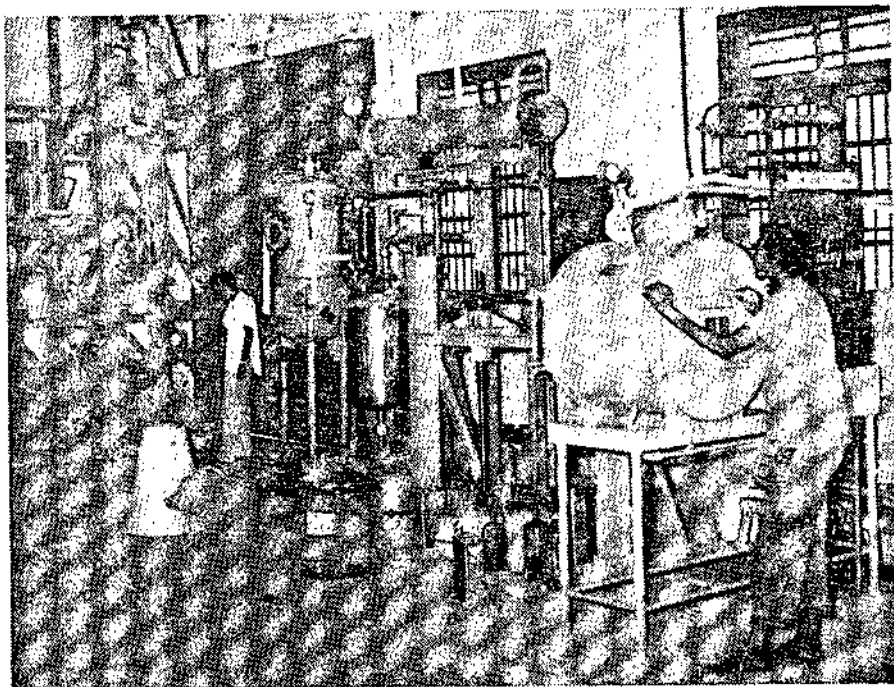
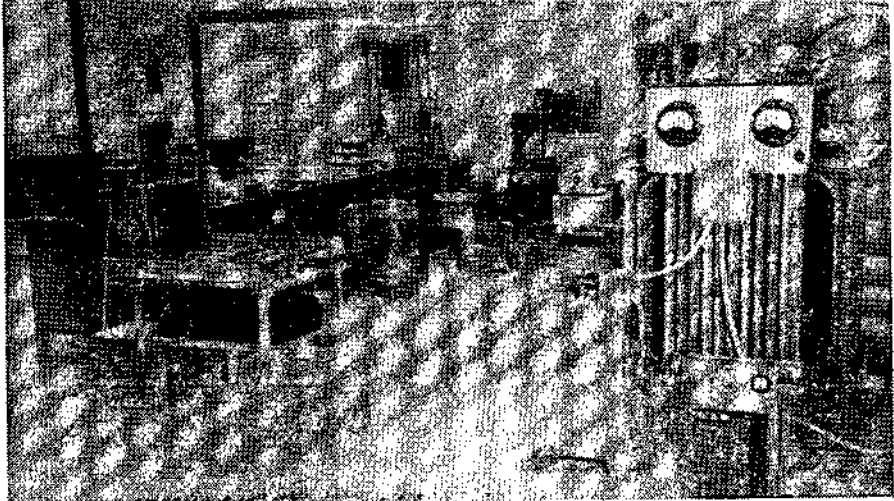
The Central Mechanical Engineering Research Institute has done considerable work towards the design of an indigenous tractor for farms and a tractor driven reaper binder for harvesting standing crops like wheat, barley, etc. and bundling the same.

The National Metallurgical Laboratory has undertaken various studies concerning the beneficiation and agglomeration of ores from different mines. It has also designed and fabricated a prototype plant for producing magnesium metal. The same facility can be used for producing calcium which is currently imported in the country.

The Central Electronics Engineering Research Institute has developed indigenous Television receivers and various electronic control systems. The Central Scientific Instruments Organisation has developed useful scientific instruments connected with medicinal electronics besides several others. The patient monitoring system and foetus monitor are well known in the first category.

The Central Fuel Research Institute has contributed to the planning of washeries of coal and as a result of this 90 per cent of the total number of washeries within the country have been laid out on this basis. It has also been established that inferior coals can be blended upto 70 per cent after suitable processing with coking coal for metallurgical coke. Processes have been developed for making smokeless domestic fuels from coal washery middlings.

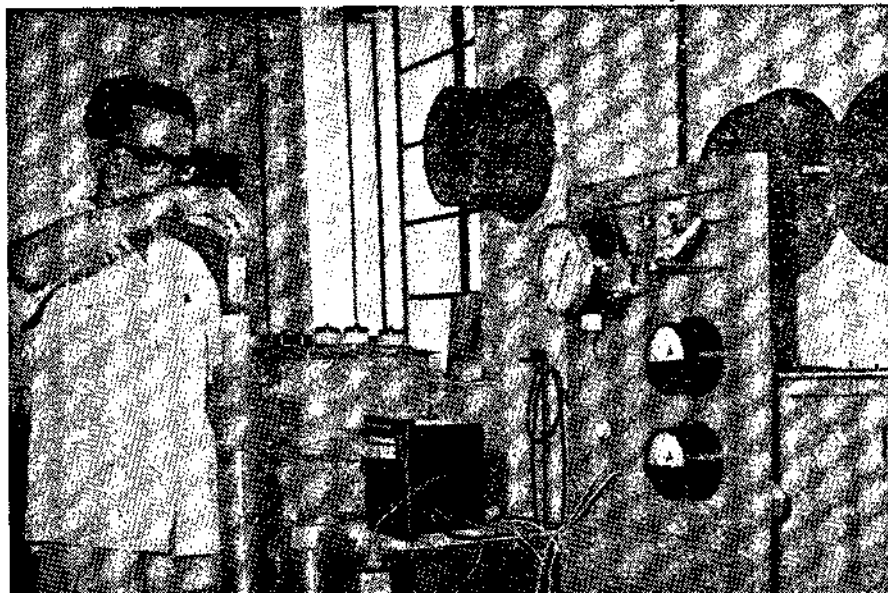
New building techniques and materials have been developed at the Central Building Research Institute, Roorkee. Based on its know-how, it undertook a mass construction programme of over 500 primary school buildings in 51 districts of UP at a project cost of Rs 5 crore. It has put up a school building 16'x40' within less than a week at a cost of about Rs 8,500 only. Structural Engineering Research Centre has developed large panels, made up of hollow clay blocks set in concrete and room size waffle-shell floor panels.



Top : Production of Sodium Chlorate using Lead Dioxide Coated Graphite Anodes. (Capacity) 25 lb/day). Central Electro-chemical Research Institute, Karaikudi.

Middle : Monomer Distillation Plant Central Leather Research Institute, Madras.

Bottom: Production of synthetic quartz single crystals by hydrothermal technique. C.G.C.R.I. Calcutta.



New techniques have been developed by the Central Road Research Institute for the construction of all weather roads using local materials.

The National Environmental Engineering Research Institute has developed techniques and plants for defluoridation of water, so that good drinking water can be made available to the people. Membrane filters have also been developed for quick analysis of water for bacteria and other contaminants.

The National Physical Laboratory maintains and is the custodian of national standards in the country. It has developed various technologies and gadgets like He-Ne lasers, X-ray diffraction topography camera, electrostatic photo copying machine, high power silicon rectifiers, ferrites, arc carbons, television picture tubes etc.

The Central Mining Research Station has developed and experimented with roof bolting and roof stitching techniques for providing effective support in the mines.

The National Geophysical Research Institute has developed integrated airborne geophysical survey facilities for minerals, the first of its kind in the country. These facilities could be utilised for assessment of indigenous mineral potentials. It has also designed various instruments for geophysical prospecting and has contributed to the development of ground water resources in certain drought stricken areas of Andhra Pradesh, Maharashtra and Punjab.

Central Glass and Ceramic Research Institute had developed techniques and plants to produce optical glass from indigenous sources which is a strategic and industrial material of immense use.

Fibre Science

A know-how in wash and wear technology has been developed which has led to an improved process for producing permanent press effects in fabrics made from the blends of cotton with polyester fibres. Research on thermodynamics of absorption of aqueous reagents on fibre surface has contributed to the theory of dyeing cellulose with direct dyes. Processes for maximising production as well as improved yield quality with existing machinery have been successfully worked out. Efforts have been made to upgrade Indian cotton by combing, controlling waste and mixing with lower ranges of cotton and blending man-made fibres.

Wet heat resistant chrome leathers have been developed at the Central Leather Research Institute, Madras.

New processes have been evolved to use E.I. and raw buff calf for processing into suede and garments to replace other and more useful leathers. Tie and Dye type of leathers have also been developed. Know-how for the manufacture of dry ready-to-wet sausage casings has been evolved for commercial exploitation.

The Wool Research Association conducted evaluation of Indian wools and has developed techniques for colour match prediction which is useful not only to the woollen mills but also in general to all the textile mills and paint industry.

The Indian Jute Industries Research Association have worked on upgrading of Jute fibres, development of all jute primary carpet backings suitable for high speed and high-density tufting; decorative jute fabrics etc.

Commitment to Social Change

Reckoning the social, industrial and technological needs of the country, an appropriate science and technology plan 1974-79 as a part of the Fifth Five Year Plan has been drawn up. CSIR has got a major role to play and commensurate with its commitments, financial resources have been tentatively allocated to it.

As regards social needs, the CSIR laboratories plan to enter the realms of housing, school building, all weather rural roads, sanitation, pollution hazards, development of mineral and ground water resources and better means of living. In consonance with the 'governmental policies, the CSIR plans to open up in different backward regions several centres and new institutions which, besides fulfilling the technological needs of the regions, will promote their development to the level of the other developed areas. A beginning has already been made in this direction in Karimnagar, Telengana, which the CSIR has adopted with a view to developing it through science and technology.

To match the need for establishing proper interface between the laboratories and industry, the CSIR proposes to strengthen its industrial, technological and scientific information service and undertake industrial surveys, marketing, economic evaluation and promotion of sale of R&D. A survey of R&D activities in CSIR laboratories with respect to their interaction with the Public Sector Enterprises was conducted. Based on identified gaps, action is being initiated to improve the communication and bring about institutional linkups for mutual benefits.

It is also proposed to facilitate transfer of technology to the backward regions through extension work at sites by the laboratories. Polytechnological clinics are also being planned to identify local industrial and technological problems which could be solved in specialist laboratories comprising inter-disciplinary task forces.

It is also planned to improve science consciousness among the people by dissemination of information and popularisation of science in regional languages.

Areas of Thrust for Future

Some of the major programmes and areas of emphasis circumscribe production of oil from coal; process for nickel extraction; copper refining; production of sponge iron; optical glass production by continuous process; production of electronic materials e.g. silicon crystals, professional ferrites, high purity alumina, phosphorus quartz crystal etc; semi conductor devices and integrated circuits; medical and optical instruments; production of various grades of refractories; production of electrodes for batteries; production of materials for aluminium industry e.g. soderberg paste, aluminium fluoride, cryolite etc; alternative power sources, viz. solar, wind and geothermal energy; organic intermediates for drugs and polymer industries; electronic devices and chemicals for defence uses, high strength materials and composites e.g. glass fibres; plastics composite etc.; leather goods and garments; utilisation of slaughter house wastes; development of airborne geophysical survey facilities; ground water surveys etc.

A number of new institutes have been proposed during the Fifth Plan. These could be considered under two categories: (i) directly under the aegis of the different laboratories and (ii) new research institutes to cater directly to the needs of industry.

Some important areas covered under the first type include Materials Science and Technology Research Centre, Regional Computer Centre at Bangalore, Centre for Advanced Research for Cellular Biology, Chemical Engineering Research Centre, etc.

Some examples of independent research institutes proposed under the second category include Welding Research Institute, Central Research Institute for Pulp and Paper Technology, Aluminium Institute of India, Solar Energy Research Institute, Institute of Tyre Research, Institute for Fermentation Research and Engineering etc. □

Imperatives For Success In FAMILY PLANNING

INDIRA GANDHI

The effectiveness of the programme should be judged by the quality and enthusiasm of our research and field workers and the impact made on the people and not by the money spent. Improvements in levels of literacy, transport and communication have a direct bearing on the success of family planning.

WE have now reached a stage when it is not enough merely to emphasise the importance of family planning or say how integral a part it is of our national policy. We shall have to do some candid self-examination, to see why we have fallen short of our goals and to devise methods of improving the effectiveness of our work.

Population has become a major topic of discussion all over the world. Studies by the Club of Rome and other organisations have made people deeply conscious of the finiteness of the world's resources. The international monetary and energy crises have brought home to the affluent the pitfalls of limitless growth. There is a third crisis—in the international grain market owing to large-scale purchases of food by some countries due to the failure of rains in large parts of the world. There is a gnawing concern that the world's climatic pattern is changing.

The current economic predicament has arisen largely from the powerful nations' inability to manage the international economic system justly or efficiently. The threat to their life styles has led some persons to blame the growth of population in countries like India. Reports and cartoons in western newspapers create the impression that grain is being grown by them only to feed India, even though we import only about three per cent of our requirements. Our own agricultural progress is completely ignored. The achievements of our atomic scientists are misrepresented, and we are lectured on the need to have right priorities! The most relevant and revealing fact is that a tiny minority in the affluent countries is using up food, petrol and other essential commodities out of all proportion to their needs. The other day I was told by an authority that more milk powder is fed to animals in Western Europe than goes to children of all the developing countries put together!

There is no doubt that the rate of growth of our population must be brought down—not in deference to the barrage of propaganda which is directed against us, but because of our own conviction that family planning is essential for improving our standards of living. When other nations were still hesitating about family control, we boldly made it one of the planks of our strategy of development. Even now there are countries which practise family planning while, for ideological reasons, they denounce it. We have favoured it on principle, yet we are aware that our performance has not been very impressive.

What are the causes of this shortfall? Comparative figures for various States show that the family planning campaign has made good progress where literacy and the educational level is high, where roads and communications are well developed and where rural health service is working well. The development of the social

infrastructure accounts for the significant reduction of the birth-rate in Kerala and Tamil Nadu.

Certain communal elements say that Muslims and Christians are against family planning. Kerala's excellent record disproves this propaganda. Among our larger States, Kerala has the highest percentage of these minorities and also the lowest birth-rate these days.

We had a basic advantage in that there was no organised religious opposition to our family planning programme. Now an artificial opposition is sought to be built up by communal groups and parties purely on political grounds. A related pseudo-political argument is being advanced that States which do well in family planning are deprived of adequate representation in Parliament, while improvident States are rewarded with larger representation, when the periodic review of the allotment of parliamentary seats takes place!

Wise parents limit their families so as to be able to give each child better opportunities in education, medical care and employment. I doubt whether the thought of attracting more scholarships influences them.

All workers of the family planning movement do not always fully appreciate the integral relationships between general development and family planning. When we reapportioned some funds to strengthen our rural health services, and there was a reduction in the percentage of the funds allotted under the separate head of family planning, there was an outcry. This was misrepresented by the international press to suggest that we were giving up our family planning programmes.

The same happens when we have local difficulties in food distribution. Legislators, and sometimes State Governments themselves, paint a darker picture than what prevails, with the object of obtaining more allocations or prompt attention.

Is the family planning movement suffering mainly because of lack of funds? Should our effectiveness be judged by the quality and enthusiasm of our research and field workers and the impact made on the people or by the overall percentage which the family planning allocation forms to the total budget? Do we ensure that every Rupee is purposefully spent? We must curb the expenditure on headquarters bureaucracy and provide more for workers in the field. Journals and books on family planning concentrate more on photographs and accounts of seminars and conferences, rather than on field work and field experience. Family planning must be for all people, not merely for family planning circles.

Whenever a movement becomes part of the general administrative structure, it loses its original drive and sense of mission. Care should be taken that the family planning movement at least does not become a victim of rules. And emphasis on security of service should

not be allowed to operate against tests of performance and accountability.

The family planning movement must encourage individual drive among its personnel. It should push ahead in areas of high promise—such as the industrial growth points. Fortunately some of our entrepreneurs and industrial managers are convinced advocates of population control. By a combination of official and non-official initiative we should be able to achieve even better results in such regions. At the other end, the family planning organisation should give special attention to the most backward areas, where there is virtually no non-official leadership. Here, official initiative is all-important. If we make the mistake of neglecting these areas, then no matter how good the achievements in the urban-industrial areas, the national average will remain low. A foreign observer of India (Prof. Galbraith) has observed that the birth control movement is so far confined to the upper slice—the educated, urbanised middle class and industrial working class and has not spread to the villages, and “it is in the villages that the babies are born”. In some of our southern States, this chasm has been crossed. We should therefore give special attention to the most back-

ward areas.

Somehow, the belief still persists that women have a greater responsibility for family planning than men.

Our own traditional attitude and the relevant social outlook in the West both tend to throw the burden on the women. I am sure that if it were not for the false pride of men (and of parents-in-law), our younger women, in villages as well as in towns, would be more enthusiastic about family planning.

Family planning is an intensely personal matter. More imaginative methods have to be devised to carry conviction to couples and to remove their doubts. Many short stories and essays in our popular journals seem to have a bias against family planning, on the mistaken assumption that it weakens conjugal loyalty. Such propaganda must be vigorously countered. Fortunately, there is more open discussion of family affairs in the villages than among the urban middle classes. Prudery should be avoided and the media should be used; but the medium is not the message and by themselves, neither posters nor films reach the hearts of the people. Far greater attention must be given to the evolution of effective means of persuasion. □

Strategy for Family Planning

The growth rate of our population has been neutralising a good part of our development efforts and is causing a labour force explosion. We have to keep running even to stay where we are. We cannot hope to solve the problem solely either by a programme of fertility control or by striving for too high a level of development.

S. CHAKRAVARTY

THE World Population Year provided us with an opportunity to discuss the problems posed by continued population growth for the world as a whole and for different countries in particular. Let us deal with problems of population growth in relation to the Indian situation.

It is well-known that population growth has accelerated in India over the last few decades and it is not necessary to quote the actual numbers which are common knowledge. There is also little doubt that the order of increase has been sizeable enough to neutralise a substantial part of the benefits of growth. The percentage of current fixed investment that is needed to maintain per capita income constant ranges over 40 per cent whereas the corresponding share for developed countries amounts to only about 12 per cent. Furthermore, the dependency ratio is very high in India with

a very pronounced bias in favour of youthful dependents, i.e., those who belong to the age group 0-14. What is more, as one would expect, the ratio of youthful dependents has increased substantially over the last twentyfive years.

Impact on Labour force

This brings us to another very important aspect of the problem and in some respects, the most important problem before the country, i.e., the problem of labour force explosion. Projections have been given in the first chapter of the Draft Fifth Plan which are indicative of the magnitude of the problem. Furthermore, the predominantly young nature of our population implies that in the medium run, the sheer inertia of the system will lead to a substantial increase in the population size, even if we could assume that the current fertility levels were going to be very significantly reduced by some miraculous device.

It should thus be abundantly clear that so long as population continues

to grow at the present rate, we have to keep running even to remain where we are. Secondly, while there is need to run ever faster, our pace is likely to be inhibited because the high dependency ratio has an unfavourable effect on our ability to save which in turn limits the amount we can mobilise for productive investment. Finally, we must recognize that we are beginning the race with a labour reserve, whose dimensions are very large.

What are the implications of these facts for determining our plan of action?

Broadly speaking, two extreme points of view are possible in this regard. One of these would suggest that all investment effort should be directed towards lowering fertility ratio to the maximum possible extent. On occasions, this approach is sought to be buttressed by statistical appeals to capital-ratios or to rates of return implicit in these types of investment. There is the other, an opposite point of view, which would maintain that there is nothing special that needs to be done in terms of reducing fertility rates. The problem will resolve itself over time if only we can maintain the tempo of development at a high level.

I think that both these views are exceedingly optimistic in terms of their respective assumptions. They both ignore certain basic problems inherent in the situation. So far as the first argument is concerned, it has already been pointed out that the mere fact of demographic inertia will alone make it necessary to provide

additional investment for absorbing the large expansion in the population size. More importantly, the protagonists of this view assume that fertility levels can be changed significantly by direct methods, analogous to public health means, an assumption by no means verified as of today.

The problem of Demographic Transition

The second approach ignores the fact that the mere continuation of population growth may postpone the completion of the process of demographic transition and thus lead to avoidable loss of social welfare. This is not to deny that it may be possible in certain favourable situations to complete the demographic transition through maintaining fixed capita formation in directly productive activities without adopting a deliberate population policy. After all, historically speaking, experience of many of the developed countries of today constitutes supporting historical evidence for maintaining such a hypothesis. Consider the case of the United States of America. The growth rate of population in the early nineteenth century was higher than 3 per cent per annum, though the current rate is around 1 per cent per annum.

The really important question, therefore, is whether the favourable conditions which permitted demographic transition to be completed without adopting a deliberate population policy exist in today's underdeveloped countries. So far as India is concerned, there is little doubt that the answer is in the negative.

Properly viewed, I think that the problem is one of adopting a package of policy measures which will help to bring about the transition much earlier than would be possible otherwise. Here the evidence that has been available from certain developing countries would appear to be somewhat encouraging. It has been found in quite a few countries of East Asia that birth rates have declined quite substantially when the GNP per capita crossed \$ 200. This means that what was achieved in Western Europe and elsewhere at a much higher level of per capita income may be reached much earlier. This is a hopeful aspect of the situation.

But let us not forget that even this gain can be obtained only through increasing our GNP level very substantially. Accelerated economic growth must therefore remain absolutely basic to any realistic population policy. Equally clearly, however, it is necessary to realize that exclusive reliance on growth alone may not bring about the demographic transition in the foreseeable future. We must therefore pay great attention to bringing down fertility levels.

It is at this stage that the question of family planning assumes importance. Unfortunately, family planning efforts cannot make much progress if we are not very clear about the strategy that is to be adopted. To determine an appropriate strategy one has to analyse the determinants of fertility levels very carefully. Our knowledge in this respect leaves much to be desired. More recently, attempts are being made to quantify

the relative importance of different factors, economic and non-economic in this regard. Here I believe that it would be very useful to analyse the inter-state variations in regard to fertility levels. Taking the crude birth rates as an approximation of fertility levels, one can look at the data thrown up by the Sample Registration System. So far as rural India is concerned, the crude birth rate per 1000, for the year 1972 varied from 31.5 in Kerala to 44.4 in Uttar Pradesh. The pooled figure for the country as a whole for the rural sector has been estimated at 38.4. Apart from Kerala, there are quite a few States like Tamil Nadu, Maharashtra and Karnataka whose crude birth rates are below 35 per thousand. For Punjab and Andhra figures are around 35. On the other side, besides Uttar Pradesh there are a few States like Rajasthan, Gujarat and Haryana which have crude birth rates exceeding 40 per thousand. For urban areas, the crude birth rates are substantially lower, excepting for Kerala where the urban-rural difference is about marginal. The highest rate is recorded for Rajasthan at 37.2 while, the all-India average is estimated at 30.5. Despite all their limitations the data to suggest certain possible hypothesis, which need to be carefully analysed. There are several obvious features which corroborate the evidence obtained from cross-country comparisons. Literacy is apparently one of the important factors. More particularly, it would appear from the data that the education of girls has a role to play in determining the overall fertility behaviour. The data

HOW FERTILE ARE INDIANS?

There were 547,949,809 people in India on Census Day, April 1, 1971, according to the Census count. This total is about 15.3% of the world's population. The increase from 1951 to 1961 was 108.8 million, at a rate for the decade of 24.7%. In that decade the people of India added to their number the equivalent of the population of Japan (the seventh most populous nation in the world) with some four million to spare.

The population situation as of 1971 was summarized by a leading Indian demographer, Dr. S.N. Agarwala. He noted that more than one million lives are added to India's numbers every month, and so the very considerable increase in agricultural and industrial production since Independence have not benefited the average Indian in similar proportion.

Deficiencies in housing and education are great. Agarwala and other observers have pointed out that the steadily increasing number of mouths to feed and youngsters to support puts heavy strains on every aspect of the nation's economy and well-being. Broad improvements in agricultural production become more difficult, unemployment rises, political turbulence is quickened (see Agarwala 1971:8; Dasgupta 1970; Kamat 1971). The sheer increase in numbers increasingly hampers the nation's vigorous efforts to alleviate poverty and raise the standard of living.

A large population and a 2.47% average annual rate of increase for the decade (2.2% geometric increase) are not of themselves fatal to economic development. Indeed, strong economic advances have been made in parti-

cular regions of India and in certain sectors of the economy. But the whole development effort tends to be shackled by the pervasive constraint resulting from population growth. Thus one study of human resources in India tells of the grave problems of the "manpower explosion of the '70s." The babies born in the population surge of 1955-65 will turn fifteen during that period, most will be ready to try to earn their living then, and the economy will not provide employment for many. No program of family planning, this study states, can have the slightest effect on these difficult problems. The economically surplus people have already been born and are growing into adulthood (Population Bulletin 1970:8).

— "Human Fertility in India"
by David G. [Mandelbaum]

for the Southern States, especially Kerala would seem to suggest that the provision of public health facilities has also an important role to play. Inverse relationship between urbanisation and birth rates is well known. But even here the Kerala data are very interesting, suggesting that different modes of urbanization may have different impacts.

I have only pointed out the implications of the broad profits that one gets if the State-wise variations alone are taken into account. I am of the opinion that quite apart from improving the accuracy of the SRS data, and its coverage—a much more disaggregative analysis needs to be carried out. Further disaggregation into reasonably homogeneous-categories may give us a lot of additional insight that may prove crucial in identifying the possible foci of action.

Effectiveness of F. P. Programmes

It is difficult at this stage to determine the extent to which the recorded data incorporate the effects of the family planning programme. One of the widely used output measure in this regard is the percentage of currently protected couples in the reproductive age group. Here again, despite all the limitations of data, there are considerable variations amongst the States. While the all-India average is about 15 per cent, there are 6 States where the percentage of protected couples ranges from 6.5 to 8.7. These are Bihar (6.5), Rajasthan (6.9), Uttar Pradesh (7.5), J&K (7.6), Assam (8.3) and Himachal Pradesh (8.7). The States, namely, West Bengal, Karnataka and Madhya Pradesh have their protected couples in the range of 11.0 to 12.7 per cent. Eight States have their respective percentages exceeding the all-India average. Here again Maharashtra, Punjab, Haryana, Gujarat and Kerala exceed the all-India average substantially.

An obvious corollary flowing from this data in terms of strategy of action is to concentrate family planning efforts in low, protected and high CBR States. It is in these States that we have a very long way to go. Uttar Pradesh, Rajasthan and Madhya Pradesh stand out in this connection as deserving of special attention.

I think that this corollary may be somewhat misleading. No one can doubt the need for action in these States. But the real question is what type of action does it call for. If the family planning programme has to be successful, it must satisfy certain pre-conditions. I think that in each one of these States, greater educational average, especially coverage of

girls is going to prove much more effective than conventional family planning programmes. Together with girls' education, I would put greater emphasis on public health measures, especially rural health measures. In regard to States where these conditions are somewhat better fulfilled, it would be necessary to emphasize other dimensions of family planning programmes. In short, we need action all along the line but given the great diversity of this country, the strategy has to be a differentiated one.

Coming to the conventional family planning programmes, we have to take a very close look at their cost effectiveness.

Cost Effectiveness

There are a number of methodological problems that are involved in measuring cost effectiveness of family planning programmes. I do not think that this is the appropriate occasion to go into these questions. However, using the data on births averted as the relevant output measure, there are considerable differences in regard to the cost of different methods. It would appear that conventional contraceptives are getting relatively more cost effective in recent years. Here, I believe that bio-medical research can help immensely by providing us with less expensive substitutes. If the cost factor can be reduced, long term possibilities in this regard would appear to be very much greater.

There are significant variations in the cost per birth averted among the States and these inter-State variations seem to have persisted over the years. For example, the cost per birth averted in the year 1968-69 varied from Rs 63 for Madhya Pradesh to Rs 202 for Rajasthan and from Rs 89 for Maharashtra to Rs 340 for Rajasthan in 1970-71. Kerala, Punjab, Rajasthan and Uttar Pradesh are the States which have registered higher cost per birth averted over the years than the All-India average. On the other hand, States like Andhra Pradesh, Assam, Bihar, Gujarat, Maharashtra, Tamil Nadu and West Bengal have registered lower costs than the all-India average. In view of the overall financial limitations under which family planning programmes have to function, it would be useful if the cost differences were examined carefully by the Ministry of Health and Family Planning with a view to reducing avoidable expenditure. I am not suggesting that complete uniformity is possible in this regard but the wide variations do suggest

possible economies which need to be explored further.

Finally, the question as to how much we can hope to achieve in terms of fertility reduction over the next ten years. As indicated earlier, our knowledge of the determinants of fertility levels is very incomplete. Furthermore, unlike the technological revolution that has taken place in the area of preventive public health measures, there has been no similar technological revolution in regard to planning of births.

We have also to recognise that while our attitude to death is unambiguous, our attitude towards birth is inherently a complex one. In the earlier days when the whole force of social opinion was strongly pronatalist it used to be uniformly positive except for certain social classes. Much more than ambiguity, there are certain basic economic problems also which need to be reckoned with. This pertains especially to the mode of economic organization that prevails in rural areas. There is a premium that is attached by parents to having children, taking into account the fact that the only asset that the vast majority of people have is their labour power. In traditional agriculture, the nature of skill requirements remains to be the same. Hence, the *quantity* of labour is prized very much more than *quality*. Our population policy is likely to make a significant impact only if the process of modernization of agriculture can be accelerated and its benefits can be made to accrue to the large mass of landless agricultural labourers, insecure tenants and small owner cultivators.

Equally important is greater reduction in infant mortality so that the parents do not feel obliged to seek safety in numbers. Social medicine also acquires a great deal of importance for a realistic population policy, quite apart from the progress that we achieve in regard to developing effective contraceptives.

Finally I, would like to point out that population policy must be reviewed in the wider context of accelerating social change. For a complex human population, regulation of number is not possible unless there is a widespread diffusion of rational social attitudes. This is a highly complex matter and does not permit of simple answers. But an overall acceleration of economic growth together with a better distribution of the benefits of growth can go a long way in expediting the process. □

SCHEDULED CASTES AND SCHEDULED TRIBES

On the 26th January, 1950 we are going to enter into a life of contradictions. In politics we will have equality and in social and economic life we will have inequality. In politics we will be recognising the principle of one man one vote and one vote one value. In our social and economic life, we shall, by reason of our social and economic structure, continue to deny the principle of one man one value. How long shall we continue to live this life of contradictions?—Dr. B.R. Ambedkar

SULABHA BRAHME

REDUCTION of inequalities in income and wealth and a more even distribution of economic power has been set as one of the objectives of national planning since the beginning of the planning era in India in 1950. The scheduled castes and scheduled tribes are economically and socially the most depressed sections of the Indian society. It has been recognised that the scheduled castes, because of their traditional socio-economic segregation and the scheduled tribes because of their socio-economic isolation can derive but limited benefits from the general programmes of economic development in the country. Special programmes were, therefore, formulated for the uplift of these depressed communities.

The plan programme for the welfare of backward classes falls into three main groups; (i) Centrally operated schemes; (ii) Centrally sponsored schemes; and (iii) State sector schemes. The important schemes that are being implemented under these categories are as follows:

(i) Centrally operated schemes—direct disbursement of post-matric scholarships; coaching-cum-guidance centres to help them qualify for reserved posts in public service; grant of scholarship to deserving scheduled caste/tribe students for studies overseas.

(ii) Centrally-sponsored schemes — (a) grant of post-matric scholarships to eligible scheduled caste students; pre-examination training centres to impart coaching for various competitive examinations, (b) Tribal Development Blocks with focus on intensive development of areas predominantly inhabited by tribal people, (c) establishment of net work of cooperative societies

of tribals with government assistance viz. forest labour societies, multipurpose societies, labour contract societies, etc., and (d) setting up of Tribal Research Institutes.

(iii) State sector schemes—(a) Education—grant of pre-matric scholarships and stipends, exemption from tuition and examination fees, grant for construction of school and hostel building, setting up of Ashram schools; (b) Economic uplift—provision of land, supply of bullocks, implements, seeds, development of cottage industry, supply of poultry, sheep, pigs, development of communication; (c) Health, Housing

and other schemes—extension of medical facility, provision of drinking water supply, allocation of house sites etc.

The expenditure incurred on special schemes for the benefit of the scheduled castes and the scheduled tribes during the course of the Five Year Plans was as under¹:

During the entire plan period about one per cent of the total public outlay was earmarked for the special programmes designed for the uplift of the scheduled castes and scheduled tribes. The population of the scheduled castes was 80 million and that of the scheduled tribes was 38 million as per 1971 Population Census. These together form about 20.5 per cent of the total Indian population. In the case of scheduled castes particular stress has been all along laid on the educational schemes. These schemes claimed nearly 60 per cent of the total expenditure incurred on the special schemes formulated for this group. The programmes of economic development had a share of only about 11 per cent in the total expenditure. This means that in the case of scheduled castes about 13 paise were spent per person per annum on the schemes of economic uplift. In the case of scheduled tribes, emphasis was placed on Tribal Development Blocks which aim at the all round development of the scheduled tribes. Nearly

EXPENDITURE FOR WELFARE SCHEMES

	(Rs crores)				
	I Plan	II Plan	III Plan	1966-69 Annual Plans	1969-74 outlay earmarked
Scheduled Tribes	17.37	40.51	52.02	34.25	142.38
Scheduled Castes	5.97	27.88	38.29	31.33	
Total :	23.34	68.39	90.31	65.58	
Total Public Sector Outlay	1960	4672	8577	6625	15902

ENROLMENT IN SCHOOLS AMONG SCHEDULED CASTES AND SCHEDULED TRIBES

		General Scheduled Tribes Scheduled Castes		
		(Percentage of enrolment in the respective age groups)		
Orissa (1968-69)	Primary	67.0	47.9	66.0
	Middle	24.0	7.2	12.6
	Secondary	11.5	5.7	9.7
Maharashtra (1972-73)	Primary	90.0		64.0
Rajasthan (1973-74)	Middle	43.0		16.0
	Primary	64.5	32.1	35.2
	Middle	31.0	7.8	12.9

1. Report of the Commissioner for Scheduled Castes and Scheduled Tribes, 1971-72 and 1972-73, Government of India. 1974. p. 173.
2. Op. cit. p. 55

60 per cent of the total expenditure was utilised for schemes of economic uplift. The per capita annual expenditure on this account amounted to about Rs 2 over the plan period.

Various schemes of educational assistance to the scheduled castes/tribes have helped spread of education during the last decade particularly among the scheduled castes. Between 1961-1971, the percentage of literacy increased from 10.3 to 14.7 among the scheduled castes, from 8.5 to 11.3 among the scheduled tribes. The general level of literacy for the country as a whole was 29.4 per cent in 1971. The enrolment of scheduled castes and scheduled tribes students in different educational institutions varies considerably between states.

School Drop-outs are More

The enrolment in schools is lower among the scheduled castes and scheduled tribes in relation to the general population and particularly, the percentage of drop-outs is considerably higher. The students enrolling in the secondary schools form less than 10 per cent of the population in that age group. The drop-outs at this stage are largely due to economic reasons. When the children can be economically useful, their education, even though free, means an economic loss to the family. The inherent economic weakness of this section thus restricts the use of the educational concessions and facilities offered to the scheduled castes and tribes to the relatively better placed families residing mainly in the urban areas. Even in an advanced state like Maharashtra the number of those who have completed higher education was 2 per 1000 persons in the case of scheduled castes. Among the rural families particularly, the agricultural labour families and the tribals the proportion of children reaching the middle school remains very low.

Special reservations are made for the scheduled castes and tribes in the Government service. Facilities for coaching are also extended. Here again those better placed among the scheduled castes who can afford to complete high school education can aspire for the Government service. The scheduled caste candidates are being recruited in class IV and class III categories of Government service in sizable numbers, whereas even the better off among the scheduled castes cannot reach in significant numbers class II and class posts. In the case of scheduled tribes their proportion in Government service is quite small.

The extension of educational facilities, particularly the higher educa-

REPRESENTATION IN CENTRAL GOVERNMENT SERVICES (1971)³

Category	Scheduled castes (percent to total)	Scheduled tribes (percent to total)
Class I	2.58	0.41
Class II	4.06	0.43
Class III	9.59	1.70
Class IV	18.37	3.65

tional facilities and the reservations in Government service are helpful to the backward communities in that they provide them some opportunity to enter in the social-political economic decision making machinery and give them some sense of participation and pride. However, their number in the key position being very small, they cannot operate effectively. The major limitation of this approach is that it covers only a very small fraction of the scheduled castes and scheduled tribes population and the vast majority is not economically in a position to benefit from these facilities.

Land Ownership and Loan Facilities

Land ownership plays a crucial role in the socio-economic position of the rural families. According to 1961 census (data for 1971 census are not available) the percentage of cultivators in the general population was 53 as compared to 38 amongst the scheduled castes. The percentage of agricultural labourers was as much as 34 amongst the scheduled castes, while it was 17 in the general population. The land holdings of scheduled caste families are on an average noted to be smaller and the lands are by and large of inferior quality. Many of these families also lack in bullock power, implements, etc. and are often forced to lease out the land and work as agricultural labourers. Preference was in principle accorded to backward classes in distribution of culturable wasteland, surplus land after imposition of ceiling etc. It is difficult to assess the economic benefits, these families derived due to land allocations, because of paucity of data. The problem of complementary resources to cultivate the land is equally serious. To meet this problem, various schemes of assistance, loans etc. have been formulated. Even then very few families are in a position to avail of these facilities because of their weak economic position.

It was observed in Maharashtra that ignorance about the concessions and the facilities available, problems of filing in the application, seeing it through the

long official process, procedural delays, etc. were some of the important difficulties encountered. In Maharashtra, it was noted that in 1967-68 only 53 farmers from scheduled castes obtained loans for land improvement and only in 39 cases the loans disbursed for well digging or well improvement were utilised for that purpose⁴.

A survey⁵ of scheduled caste families in selected districts of Maharashtra conducted in 1970 showed that the per capita annual income of the scheduled caste families was about Rs 2000. Over 70 per cent of the scheduled caste families were below the poverty line (Rs. 330 per capita per annum at 1970 prices). The corresponding percentage was about 40 for the State as a whole. A study⁶ of the Harijan community was carried out in 1970 in four districts of Tamil Nadu. The average per capita income of the Harijan was noted to be Rs 227 while it was Rs 406 in the case of the non-Harijan. Sixty-three per cent of the Harijan families as against 46 per cent of the non-Harijan families reported per capita annual income below Rs 300.

The major programme for economic uplift of the scheduled tribes was the Tribal Development Blocks. There are 484 Tribal Development Blocks in the tribal areas of the country. Some of the findings of studies by Tribal Research Institute show that development block programmes succeeded in making only a limited impact due to certain inherent problems of the socio-economic situation viz. subsistence level of living of tribals, under developed infrastructure, high percentage of illiteracy etc. The programme has also been adversely

3. Op. cit. p. 89.

4. *Dalitanchya Samasya* (in Marathi), S.B.S. Granthalaya, Poona, 1973. p. 61.

5. *Maharashtratil Dalit, Shodh ani Bodh* (in Marathi) Dr. Govind Gare, Shri Shirubhau Limaye, Sahadhyaya Prakashan, Bombay, 1973.

6. *Income-Earning Trends and Social Status of the Harijan Community in Tamilnadu*, A. Vagiswari, Sangam Publishers, Madras, 1973.

commented upon for the following reasons.⁷

- (i) A large number of standardised schemes in vogue among advanced communities has been applied to tribal areas;
- (ii) Employment aspect of development has not been attended to;
- (iii) Settlement of land dispute at pre-extension stage was not taken up;
- (iv) 60 to 70 per cent of the funds are spent on 'brick and mortar' schemes.

In individual blocks certain improvement in agriculture, particularly where some irrigation facility could be provided has been noted. However, the number of families benefiting is far too small in relation to the total number involved. For example, in the draft Fifth Five Year Plan of Maharashtra State there is a scheme of rehabilitation of the backward class families. Under this scheme land, bullock, implements, house etc. are being provided to each family. Economic rehabilitation of 150 families is envisaged during the Fifth Plan Period. The number of backward class families in the State is about 25 lakh. This clearly indicates the dimensions of the problem and the extent of present efforts.

The forms of schemes have been undergoing various changes, certain modifications in view of local problems are being introduced, special funds have been allocated and spent over the last twenty years for the socio-educational and economic improvement of the people on the lowest rung of the socio-economic ladder. The impact of the effort would best be summarised in the words of the Commissioner for Scheduled Castes and Scheduled Tribes.

"...with the enforcement of forest laws without much consideration to the human life in these forest areas; land restrictions and alienation of their lands; the indifference shown towards the human problems of the tribal communities by the planners of industrial projects in the tribal areas; their dependence on, and exploitation by the money lenders, landlords and other unscrupulous elements, like liquor contractors, have greatly disturbed their way of life. No doubt, since Independence, efforts have been made to ameliorate their economic and social conditions and steps have been taken by the concerned State Governments for their development. It is however unfortunate that in spite

of specific safeguards provided in the constitution for their protection and advancement, most of the tribals not only remained neglected but an exploited lot also."⁸

The basic problem raised by Dr. Ambedkar 25 years back has not been squarely faced. The wide inequalities which we have by reason of our social and economic structure persist today. The scheduled castes and scheduled tribes continue to work largely as agricultural laborers, with inadequate work and low wages, or cultivate some

8 Op. cit. p. 5.

inferior piece of land, without complementary inputs. If they have received some education, they join in large numbers the ranks of the urban unemployed and only a few have gained from the schemes and have reached some position of social, political or economic importance, but such number is infinitesimal. The present approach of concessions and special schemes can hardly deliver more than what it contains. It is time that in 1975 one tries to take a fresh look at the problem and see that the downtrodden classes get a rightful place in the socio-political-economic structure. □

QUOTATION BOX

If Parliament is, in fact, derived from the French "parler le ment" to speak one's mind, its language must necessarily match the rough and ready thoughts of our rural constituencies.

—The Statesman

I am opposed to the idea that art is to be designed for everybody—this is the wrong Hollywood concept—There is a vanguard, a more opinion-creating group, often young workers, and peasants who are open-minded.

—Krzysztof Zanussi
Film Director, Poland.

We must have a law demanding maintenance of honest accounts and their annual publication by every political party, and party bosses who fail to do so must be sent to jail.

—N.A. Palkhivala

We have learnt from our mistakes.

—Siddhartha Sankar Ray

The red triangle, it seems, has now spread to the insect world.

—The Statesman

It is not Right or Left but it is the upright Congressman who matters.

—Dev Kanta Barooah

A woman is born for adjustments.

—Dr. Asima Chatterjee

Bengal's sons-in-law do rather well in cricket as our girls have

done in the national cricket championship.

—Siddhartha Sankar Ray

I have found my new lover—India.

—Gina Lollobrigida

As always in Africa, there will also be developments this year that only a competent witchdoctor could predict. As the saying goes, the only thing of which you can be certain is that you can be certain of nothing else.

—Russell Warren Howe

Western technologies were designed to slash the need for people and maximise the need for capital. They were so capital-intensive that they tend to become prerogatives of the richest centres and a means of economic exploitation, sometimes even blackmail.

—Dr. H.R. Sethna

I am very interested in seeing that enough men attend the Women's Year World Conference. Male involvement is essential because women alone can't change what has to be changed (to create true equality).

—Helvi Sipilä
U.N. Assistant Secretary General.

He who produces the goods must get the benefit.

—Jagjivan Ram

Nations co-operate when the going is good and where even the losers are still enjoying rising living standards.

—The Economist

DIARY OF EVENTS-1974

January

- 1 Keel of an estuarine dredger to be the biggest so far built in India, laid at the Garden Reach Workshops, Calcutta.
- India and New Zealand in a joint statement issued in New Delhi reaffirm their support for the concept of the Indian Ocean as a 'zone of peace'.
- Direct tele-communication link between Bombay and Colombo inaugurated.
- A new rock-cut cave discovered at Ellora.
- 3 President's rule imposed in Pondicherry.
- 8 Prime Minister Indira Gandhi inaugurates the Ghaziabad Unit of Bharat Electronics Ltd. to produce electronic equipment for the air defence ground environment system.
- 9 Foundation-stone of Rs 15-crore transformer factory of BHEL laid at Jhansi.
- 12 Foundation-stone of the country's fourth atomic power plant laid at Narora, Uttar Pradesh.
- 14 A protocol providing for collaboration in the field of oil exploration and production signed between India and the Soviet Union in New Delhi.
- 15 Foundation-stone for an Agricultural University at Faizabad laid.
- 16 Prime Minister Indira Gandhi lays the foundation-stone of the IFFCO fertilizer plant at Phulpur near Allahabad.
- 21 Deposits of about 14 crore tonnes of iron ore and valuable atomic metals found at Tiruvannamalai and Sevathur in Tamil Nadu.
- 25 President Josip Broz Tito of Yugoslavia receives the 1971 Jawaharlal Nehru Award for the Promotion of Peace and International Understanding in New Delhi.
- 27 President V. V. Giri dedicates Nehru Memorial Library at Teen Murti House to the nation.
- 29 Prime Ministers of India and Sri Lanka reach agreement on the future of the 1,50,000 persons of Indian origin in Sri Lanka left uncovered by the 1964 Agreement.
- Eight States—Bihar, Haryana, Himachal Pradesh, Jammu and Kashmir, Punjab, Rajasthan, Uttar Pradesh and West Bengal and two Union Territories

- Chandigarh and Delhi agree among themselves to provide for free movement of goods by trucks on payment of road tax at a single point.
- 30 Work inaugurated on the Rs 42-crore Western Kosi Canal at Khojpur, Madhubani district, Bihar.
- 31 The first steel melting shop at Bokaro designed to produce 17-lakh tonnes of crude a year, commissioned.
- The Union Cabinet approves the first nickel-cobalt plant to be set up at Sukinda in Orissa.
- The Geological Survey of India discovers existence of sedimentary barytes, first ever in India, in Mangampeta, Cuddapah district, Andhra Pradesh.

February

- 2 The Vikram Sarabhai Space Centre designs and builds a digital plotter which can draw sketches, write any language and even cast one's horoscope in a jiffy, guided by a computer.
- 3 'Sagar Samrat', India's first offshore mobile drilling platform, spuds the first oil well in Bombay High structure.
- 4 Satyendranath Bose, 80, national professor and world renowned scientist, dies.
- 5 An agreement for Indian technical assistance for setting up a fertilizer plant in Iraq signed.
- 6 India and Federal Republic of Germany sign an agreement in the field of nuclear power generation.
- 9 Gujarat is placed under President's rule, Assembly suspended.
- 11 India and Bulgaria sign an agreement to avoid double taxation.
- A full bench of the Punjab and Haryana High Court strikes down certain provisions of the Punjab Land Reforms Act, 1972 relating to the concept of family ceiling.
- 14 Ustad Amir Khan, 62, renowned Hindustani vocalist and Dr. S.N. Ratanjankar, 74, noted musician and Musicologist pass away.
- 15 Work on the year-long third national educational survey begins.
- 18 The 1973 Jawaharlal Nehru Award for the Promotion of Peace and International

Understanding awarded to President Nyerere of Tanzania.

- An agreement between India and the USA regarding the disposal of American-held rupees arising out of PL-480 and other aid programmes formally signed.
- 19 Oil struck at a depth of 962 metres in the first well drilled in the Bombay High structure.
- 20 Nagaland Assembly election results announced; United Democratic Front wins 25 seats, Nagaland Nationalist Organisation 23 and Independents 12.
- 21 A mineral belt containing a reserve of about 5 crore tonnes of wollastonite and calcite discovered near Belka-Nahar in Sirohi district, Rajasthan.
- 26 A United Democratic Front Ministry headed by Tsukru Vizol sworn in at Kohima.
- In the third general election to the 30-member Pondicherry Assembly, ADMK wins 12 seats, Congress 7, Congress (O) 5, DMK 2, CPI 2, CPI(M) 1 and Independent 1.
- 28 The 1973 Sahitya Akademi awards presented.
- Of the 59 results declared to the 60-member Manipur Assembly, MPP wins 20 seats, MHU 12, Congress 12, CPI 6, SP 2, KNA 2 and Independents 5.

March

- 1 Congress gets absolute majority in the 425-member UP Assembly by capturing 213 seats.
- In the elections to the 147-member Orissa Assembly, Congress wins 69 seats, Utkal Congress 33, Swatantra 21, CPI 7, CPI(M) 3, SSP 2, SPI 2, Jana Congress 1 and Independents 8.
- The 1973 Sangeet Natak Akademi awards presented.
- 3 Foundation-stone of a naval science and technical laboratory to develop modern naval weaponry laid at Visakhapatnam.
- A two-member United Legislative Party Ministry headed by Mohammed Ali-muddin sworn in in Manipur.
- Parliament approves the Presidential and Vice-Presidential Elections (Amendment) Bill, 1974.
- 5 An 11-member Congress Ministry headed by H.N. Bahuguna sworn-in in Uttar Pradesh.

- A 17-member Ministry headed by Smt. Nandini Satpathy sworn-in in Orissa.
- A four-member Anna DMK Ministry headed by S. Ramaswamy sworn in Pondicherry.
- India and Bulgaria sign agreements which provide for a five-year trade and payments arrangement, a protocol on economic, technical and scientific co-operation and the abolition of visas for the nationals of the two countries.
- Mizoram declared as disturbed area for six months from March 1.
- 7 T. T. Krishnamachari, 74, former Union Finance Minister, dies.
- 9 Fourth Leander class frigate for the Indian Navy, INS "Dunagiri", built at the Mazagon Dock, launched.
- Oil struck at Charali near the Rudrasagar oilfield in Assam.
- 10 Yuv Vani starts from Jammu station of AIR.
- 12 Parliament approves ES-SO (Acquisition of Undertakings in India) Bill, 1974.
- 13 Telecommunication link between India and Maldives established.
- 15 Gujarat Legislative Assembly dissolved.
- Indian Council of Agricultural Research signs two separate agreements with International Maize and Wheat Improvement Centre and the International Rice Research Institute for scientific co-operation in research on rice, wheat and maize.
- V. V. Mirashi, Indologist and Sanskrit scholar, Prof. V. R. Trivedi, literary critic, Dr. Sukumar Sen, writer and Dr. Masti Venkatesha Iyengar, writer, made Fellows of Sahitya Akademi.
- Uranium found in the rock foundations in the Sonrai area of Jhansi district, Uttar Pradesh.
- AIR and Deutsche Welle of West Germany sign in New Delhi a three year protocol for cooperation in the field of radio and television.
- 15 M. D. Pathak, Indian entomologist, receives the Borlaug Award for 1973 for outstanding contribution to agriculture.
- 17 Lunar crater "Bassel" named after the late Dr. Vikram Sarabhai at the Sydney

meeting of the International Astronomical Union.

— India's first lion safari park declared open at Nehru Zoological Park, Hyderabad.

18 Oil struck in the third layer in the Bombay High structure at a depth of 1,600 metres.

21 CPI joins the Pondicherry Ministry raising its strength to five.

— Anandpat of Ahmedabad awarded first prize in an international colour photo competition entitled "Men and Humanity" held recently in Frankfurt, FRG.

22 The Minerals and Metals Trading Corporation signs with Poland, for the first time, a direct contract for supply of process mica valued at Rs. 1.22 crores during 1974-75.

23 1974 Republic Day Awards presented.

— Geological Survey of India begins work on the Siwalik national fossil park at Saketi, Sirmur district, Himachal Pradesh.

— Under an agreement signed in New Delhi, India will build the Chukha hydroelectric project in Bhutan.

24 Telugu becomes official language at taluk level in Andhra Pradesh.

26 Bharat Heavy Electricals, Bhopal, develops for the first time in India an electrohydraulic governor for hydroelectric power stations.

27 The second bucket dredger "Kichodhara" being built at Mazagon Dock, Bombay, launched.

— The ADMK-CPI coalition Ministry in Pondicherry resigns.

— Karnataka wins Ranji Trophy for the first time by defeating Bombay in the final at Jaipur.

28 President's rule proclaimed in Pondicherry; Assembly dissolved.

— Under an agreement signed in New Delhi, Iraq will provide a loan of \$ 110 million to India for the import of 2.8 million tonnes of Iraqi crude during 1974.

— India and Iraq agree that the entire Indian Ocean should be a zone of peace.

— Under an agreement signed in New Delhi, the Bharat Heavy Electricals Ltd., will supply to Malaysia three high pressure boilers and ancillaries worth about Rs. 10 crore.

30 Electronics Corporation of India develops a computer known as TDC-16 which can make 4,00,000 additions and subtractions a second.

April

1 Prime Minister Indira Gandhi lays the foundation-stone of a Rs. 250-crore fertilizer project at Paradip.

5 The first-ever tripartite meeting between India, Pakistan and Bangladesh begins in New Delhi.

9 Foreign Ministers of India, Pakistan and Bangladesh sign in New Delhi an accord to clear the way for the normalisation of relations among the three countries and the establishment of a durable peace in the region.

— India and Pakistan conclude a bilateral agreement listing out priorities to be given for restoration of normal relations between the two countries.

14 Kumbh Mela held in Hardwar.

20 President Giri inaugurates at Itanagar the new capital township of Arunachal Pradesh.

— Tamil Nadu Assembly passes an official resolution urging the Centre to effect immediate changes in the Constitution to ensure "a truly federal set-up with full state autonomy".

24 Ramdhari Singh "Dinkar", 65, Hindi poet, dies in Madras.

— The Supreme Court rules that sections of the Gujarat University Act 1949 as amended in 1973 which seek to regulate and restrict certain rights of managements of colleges affiliated to the University, do not apply to institutions established and administered by linguistic and religious minorities.

27 India and UNDP sign in New Delhi a four-year agreement for establishing, for the first time in India, a sponge iron plant at Kothagudem in Andhra Pradesh.

28 Indian Space Research Organisation announces that the 300-kg mechanical prototype of the first Indian Scientific Satellite Project (ISSP) has been successfully "mated" with the inter-cosmos rocket in the Soviet Union.

— G. L. Mehta, 74, former Indian Ambassador to the United States, dies in Bombay.

30 Repatriation of about 93,000 Pakistani prisoners of war and civilian internees completed.

May

2 In a joint communique issued at the end of Prime Minister Indira Gandhi's visit to Iran, both the countries reaffirm their

support for declarations of the Indian Ocean as a zone of peace.

— Frank Moraes, 66, journalist, dies in London.

5 Mangalore declared a major port.

8 Railwaymen throughout the country go on an indefinite strike demanding bonus and pay parity with workers in public sector undertakings.

— The Lok Sabha adopts Constitution (33rd Amendment) Bill which seeks to check forced resignation of legislators.

10 The Lok Sabha rejects no-confidence motion against Government for failure to arrive at settlement with the railway employees.

14 President issues an order extending by another five years (upto May 14, 1979) certain special constitutional privileges enjoyed by Jammu and Kashmir.

— The Rajya Sabha passes the Constitution (33rd Amendment) Bill.

16 India and Bangladesh sign in New Delhi a border demarcation agreement.

17 Durga Das, 73, journalist, dies.

18 India carries out underground nuclear experiment at Pokhran, in the Rajasthan desert.

20 The President assents to the Constitution (33rd Amendment) Bill, 1974.

21 The Sahitya Akademi confers its first honorary fellowship to a scholar of a foreign country on President Senghor of Senegal.

22 India and Senegal sign in New Delhi agreements on economic co-operation and mutual trade.

28 Strike by railwaymen withdrawn.

— Kothari Committee on recruitment and selection methods for All India and Central Services set up.

June

1 The Vikram Sarabhai Space Centre successfully flight-tests RH-100 rockets employing helical welding technology, developed for the first time in the country at the Centre.

3 K.B. Sahay, 76, former Chief Minister of Bihar dies.

5 The Supreme Court expresses the opinion that the Presidential poll should be held notwithstanding the dissolution of the Gujarat Assembly and that the election must be held before the expiry of the five-year term of President V.V. Giri.

— D.F. Karaka, 63, journalist, dies.

12 Large deposits of lead, zinc and copper found at Deri in the Sirohi district of Rajasthan.

17 Yadavendra Singh, 61, India's Ambassador to the Netherlands and former Maharaja of Patiala, dies at the Hague.

18 Seth Govind Das, 78, Hindi litterateur and oldest parliamentarian, dies.

21 India extends a standby credit of Rs. 5 crore to Nepal.

— "Basant" the, first agricultural aircraft designed and built indigenously, rolls out of the Hindustan Aeronautics Limited.

22 An ordinance amending the Essential Commodities Act, 1955, to provide for more deterrent punishment for blackmarketing, hoarding and profiteering, promulgated.

— "Jagdoot", the 21,800-DWT multi-purpose bulk carrier, the biggest to be built so far at the Hindustan Shipyard, launched.

27 Super thermal power station at Koradi, near Nagpur, starts generating power.

28 India and Sri Lanka sign a comprehensive border agreement under which Kachchativu becomes part of Sri Lanka.

July

6 The Companies (Temporary Restrictions on Dividends) Ordinance, 1974 and the Additional Emoluments (Compulsory Deposit) Ordinance, 1974 promulgated.

8 Manipur coalition Ministry resigns following defeat over the Manipur Appropriation Bill, 1974.

9 First of the four units of Gujarat's first hydroelectric project at Ukai, near Baroda, commissioned.

10 An eight-member coalition ministry of the Progressive Democratic Front headed by Y. Shaiza sworn in at Imphal, Manipur.

— The Daryabad branch of the Rs. 200-crore Sarda Sahayak irrigation project commissioned.

12 Tuticorin declared the tenth major port of the country.

14 Bauxite deposits estimated at 105 crore tonnes with 45 to 59 per cent of alumina content and said to be the second biggest deposit in the world, discovered in Koraput, Kalahandi and Sambalpur districts in Orissa.

- 17 The President promulgates Compulsory Deposit Scheme (Income-tax Pay-ers) Ordinance, 1974.
- India and UN Fund for Population Activities (UNFPA) sign in New Delhi a five-year agreement involving a UNFPA grant of about Rs. 30 crores for India's family planning programme.
- 19 President V. V. Giri inaugurates helicopter division at Hindustan Aeronautics Ltd., Bangalore.
- 20 The Nuclear Research Laboratory at IARI, New Delhi, is formally handed over to India by the United Nations Development Agency.
- 22 Reserve Bank of India raises the bank rate from seven to nine per cent.
- 26 India and Bhutan sign in Thimpu an agreement under which India will set up a cement factory at Pagli, Bhutan.
- 27 India and Bangladesh sign agreement in New Delhi under which India will supply 500 wagons to Bangladesh.
- 31 A supplementary budget to raise Rs. 232 crores from new levies in a full year presented to Lok Sabha.
- August**
- 1 M. C. Setalvad, the former Attorney-General of India, dies in Bombay.
- 2 India and Japan sign in Tokyo an agreement under which Japan will provide a loan amounting to Rs. 29.81 crores to meet a part of the foreign exchange costs of the Bhatinda fertilizer project.
- 3 Air-India declares a lock-out following pilots' refusal to accept slip system.
- 5 A contract for a sponge steel complex at Dubai to be built by India signed at Ranchi with the United Arab Emirates.
- 8 India and Indonesia sign in Jakarta a continental shelf agreement.
- 9 The Union Minister of Petroleum and Chemicals announces in Parliament that oil has been struck at a well at Galeki, Assam, which can produce 150 tonnes a day against the current production of 20 tonnes a day in other wells.
- 20 Fakhruddin Ali Ahmed declared elected as the fifth President of the Republic.
- The Lok Sabha passes the second Finance Bill containing the supplementary taxation proposals.
- Supplementary railway budget presented to the Lok Sabha.

- 24 Fakhruddin Ali Ahmed sworn in as President of India.
- 26 The Lok Sabha passes unanimously the Constitution (Thirty-fourth) Amendment Bill seeking to insulate states' land ceiling and land tenure laws against litigation.
- 27 B. D. Jatti elected as Vice-President.
- 28 Rajya Sabha approves the Constitution (Thirtyfourth) Amendment Bill.
- 29 Seven parties—BKD, Swatantra, Samyukta Socialist Party, Utkal Congress, Rashtriya Loktantrik Dal, Kisan Mazdoor Party of Haryana and Punjab Khe-tibari Zamindar Union—combine to form a new party, Bharatiya Lok Dal (BLD).
- 31 M. S. Subbulakshmi receives in Manila the 1974 Ramon Magsaysay Award for public service.

September

- 1 The perlite expansion plant of Talcher fertilizer project in Orissa commissioned.
- 3 Foundation-stone of a Rs. 8-crore scooter factory laid at Futwah, near Patna.
- 1 Parliament adopts Constitution Amendment Bill seeking to make Sikkim an associate state of the Indian Union.
- 9 Parliament approves the Oil Industry (Development) Bill, 1974, which seeks to set up an oil development fund by imposing a cess by way of excise duty on crude and natural gas.
- Parliament adopts Payment of Bonus (Amendment) Bill, 1974, providing for the payment of minimum bonus of 8.33 per cent in respect of the accounting year 1973.
- 14 India and Pakistan sign in Islamabad agreements for the resumption of postal telecommunication and travel facilities and a protocol on the exchange of pilgrims to shrines.
- 17 India finishes seventh with four gold, twelve silver and twelve bronze medals at the Seventh Asian Games in Teheran.
- Ordinance promulgated to enable detention of smugglers under the Maintenance of Internal Security Act (MISA) up to a maximum period of two years.
- 18 Foundation-stone of a concrete dam for the 690 mw Salal hydel power project aid in J&K.
- 20 "Paraplegic Home", the first of its kind in Asia, for total rehabilitation of

- critically disabled jawans opened at Kirkee near Poona.
- An electronics testing and developing centre to test commercial electronics products, is inaugurated at Baroda.
- 21 An Ordinance promulgated for the take-over of 103 sick textile mills.
- 22 Soumyendra Nath Tagore, 73, veteran revolutionary and founder of the Revolutionary Communist Party of India, passes away.
- 23 Jayachamarajendra Wad-iyar, 55, former Maharaja of Mysore, dies in Bangalore.
- India and Romania sign in Bucharest a five-year protocol enabling India to export 13 million tonnes of iron ore and import, among other things, 1.5 million tonnes of fertilizers and 14 drilling rigs.
- 26 Indian Space Research Organisation announces that the prototype of the satellite separation system to eject its satellite into orbit has been successfully ground tested.
- India's first NCC air squadron for girls inaugurated at Banas-hali in Rajasthan.
- October**
- 6 V. K. Krishna Menon, passes away in New Delhi.
- 10 Union Council of Ministers reshuffled.
- 11 India and Bulgaria sign in New Delhi an agreement for co-operation in the fields of science and technology.
- The first unit of the thermal power plant at Bha-tinda in Punjab commissioned.
- Under an agreement signed at Tripoli, India agrees to buy Libyan crude and provide Libya with oil technicians.
- 15 Indo-Pak postal and telecommunication links restored.
- Government of India lift the 14-year-old ban on travel to Portugal.
- 19 India's widest flyover inaugurated in New Delhi.
- 25 India signs the biggest single contract for supplying 300 buses to Zaire in Kinshasa.
- 27 Dr. Henry Kissinger, the US Secretary of State, arrives in New Delhi.
- The Indian Pilots Guild call off the 88-day-old strike against the slip system in Air India.
- 28 India and the USA sign in New Delhi an agreement for establishing a joint commission on economic,

commercial, scientific technological, educational and cultural cooperation between the two countries.

30 Begum Akhtar, 'ghazal queen', 60, passes away in Ahmedabad.

November

- 1 Ait India lifts lock-out.
- India to get Rs. 10 crore worth of microwave communications equipment from Hungary under a protocol signed in New Delhi.
- Third Asian Buddhist Conference for peace opens in New Delhi.
- 8 Dr. D. R. Bendre, Kan-nada poet and Gopinath Mohanty, Oriya novelist jointly receive the 1973 Bharatiya Jnanpith Award.
- Rs. 64-crore ammonia urea complex of the Indian Farmers' Fertiliser Co-operative commissioned at Kalci in Gujarat.
- 10 The Khetri Copper Smelter starts functioning in Jhunjhunu district of Rajasthan.
- 12 India and Bangladesh sign an agreement in New Delhi under which India will provide an emergency credit of Rs. 10 crores to Bangladesh.
- 16 French statesman, writer and artist, Andre Malraux, receives in New Delhi the Jawaharlal Nehru Award for the Promotion of Peace and International Understanding for 1972.
- The President issues an order suspending the MISA detainees' right to move court.
- 18 Indo-Pak talks on the resumption of overflights and air links begin in Rawalpindi.
- India and Hungary sign in New Delhi a memorandum of understanding under which India will supply a complete coke oven plant to Hungary.
- India and Pakistan establish telex lines.
- 20 The new Rs. 12.22-crore "double-decker" rail-and-road bridge across the Godavari on the Calcutta-Madras national highway opened to traffic.
- 22 India and GDR sign a trade protocol envisaging turnover of R. 100 crore between them during 1975.
- 23 INS 'Himgiri' commissioned at Bombay.
- 30 India and Pakistan sign in New Delhi a protocol for the resumption of trade between the two countries.
- India and Romania sign in New Delhi a trade protocol for 1975 for a turn-over of Rs. 113 crores.

1 The Adaptive Rice Research Centre at Baronda near Raipur in Madhya Pradesh develops a new strain of paddy, said to be the longest variety in the world.

— Smt Sucheta Kripalani, former Chief Minister of Uttar Pradesh, passes away in New Delhi.

— The first of the seven units, to make butterfly and other types of industrial valves, especially for thermal and atomic power stations, the first of its kind in Asia, inaugurated at Bangalore.

2 The 19th International Dairy Congress opens in New Delhi.

3 India and the German Democratic Republic, in a joint communique issued in New Delhi, call for liquidation of all foreign military bases in the Indian Ocean.

— India and Czechoslovakia sign in New Delhi an agreement providing for exchange of television and radio programmes on a regular basis.

5 The five-month old Manipur Ministry headed by Chief Minister Y. Shaiza resigns.

— A two-member Ministry in Manipur headed by

Rajkumar Dorendra Singh sworn in at Imphal.

7 The nine-year old embargo on trade between India and Pakistan ends under the agreement signed by the two countries on 30 November 1974.

8 Kasturi Gopalan, 84, publisher of *The Hindu* passes away in Madras.

9 India and Pakistan exchange last batch of 1971 pre-war detainees at Wagah checkpoint.

— India and Norway sign in New Delhi an agreement under which Norway will extend to India an assistance of nearly Rs 7.5 crores for strengthening the family welfare programme in rural areas.

10 The country's first high-powered sophisticated Air Route Surveillance Radar (ARSR) commissioned at the old Juhu airport in Bombay.

11 India and Iran sign in Teheran an agreement to establish a joint shipping company with Iran holding 51 per cent of the equity shares to expedite the trade and economic cooperation between the two countries.

12 S. A. Dange and G. Rajeshwara Rao, CPI leaders, receive 'Order of Lenin', the highest Soviet civilian award, in Moscow.

14 The second 120 mw unit at Koradi super thermal power station near Nagpur commissioned.

— President Fakhruddin Ali Ahmed presents the Arjuna Awards, to 17 top performers in 1973 in different disciplines of sport.

15 Smt Rasoolan Bai, doyen of Varanasi Gharana of classical music, passes away in Allahabad.

— The 1000-tonne-per-day ammonia plant of the joint sector Southern Petrochemical Industries Corporation, said to be the largest in the World, commissioned at Tuticorin.

— Lok Sabha passes the Representation of Peoples (Amendment Bill) which, replaces the Ordinance issued on 19 October 1974, making it clear that election expenses incurred by political parties would not be subject to the expenditure ceiling provision.

16 The President gives assent to the Conservation of Foreign Exchange and Prevention of Smuggling Activities Bill which, among other things, provides for preventive detention.

17 India and Indonesia ratify the agreement demarcating the continental shelf boundary between the two countries.

— India and Bangladesh sign protocol in New Delhi under which two countries agree to abandon their balanced rupee trade and transact in freely convertible currencies from 1 January 1975.

— Third oil well on Bombay High spudded after successful production tests on the first two wells.

19 Dr. Suniti Kumar Chatterjee, President of the Sahitya Akademi, was awarded the humanities gold medal of the Asiatic Society of Bangladesh.

20 Indian Navy's second Sea-King Anti-Submarine Air Squadron commissioned at I.N.S. Garuda in Cochin.

21 INS Saravahana, the first establishment of its kind in India to give submarine training and escape and diving training, commissioned at Visakhapatnam.

25 The President reissues the order preventing those detained for smuggling activities or violations of foreign exchange regulations from exercising their fundamental right to move courts for legal remedy.

27 The 21-year-old statutory control on the prices of the three passenger cars—Premier-President, Ambassador and Standard removed.

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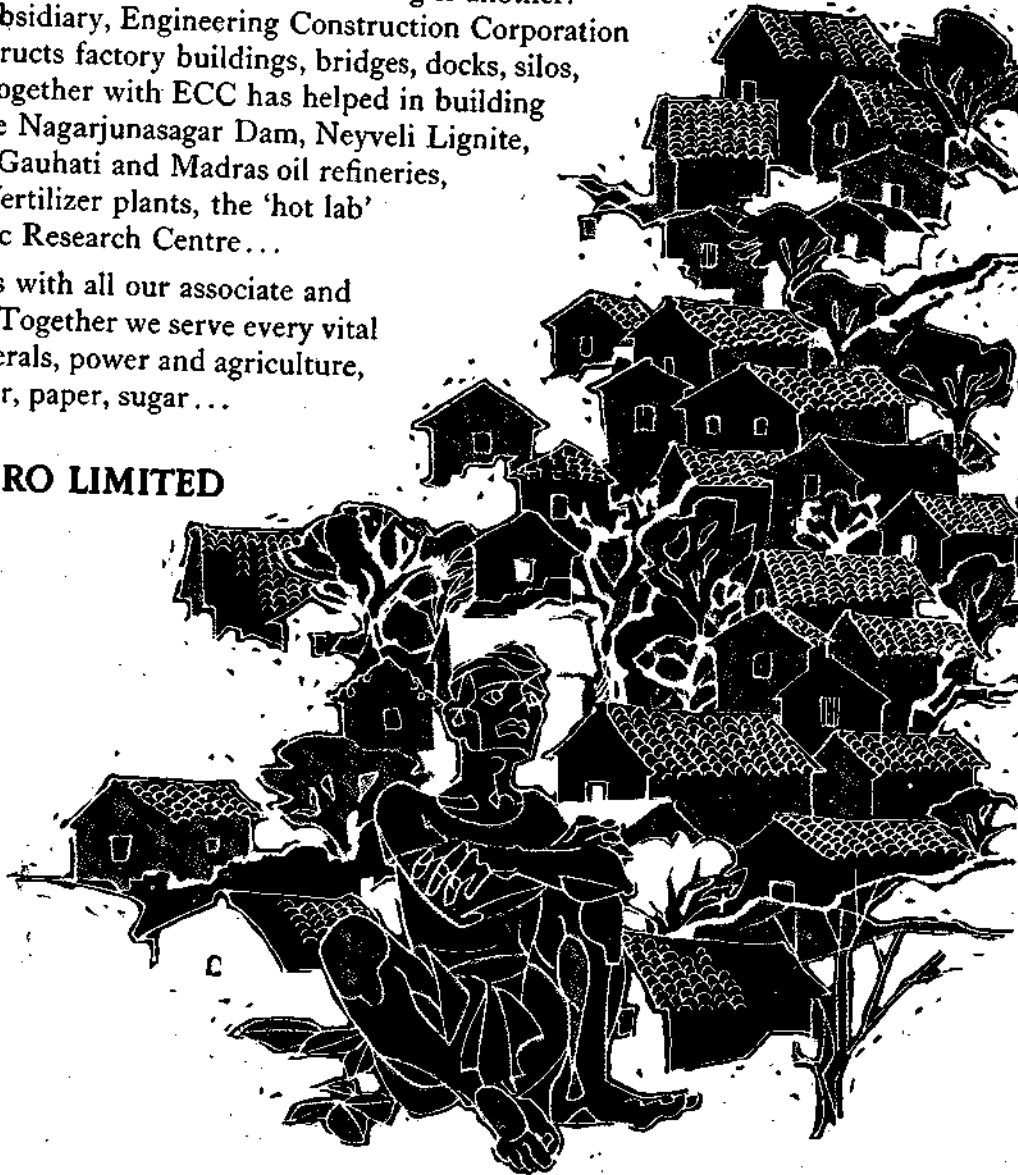
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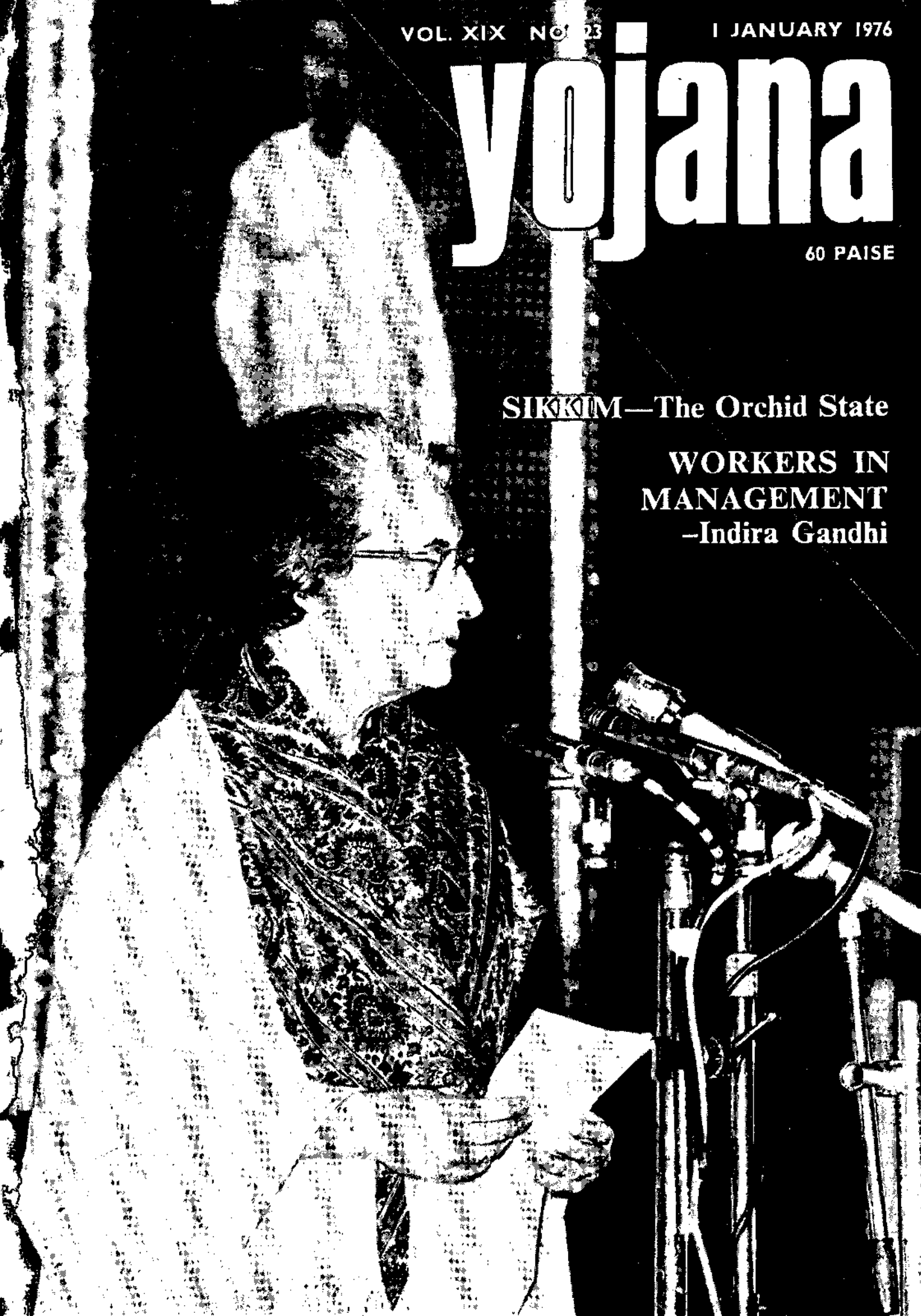
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SIKKIM—The Orchid State

**WORKERS IN
MANAGEMENT
—Indira Gandhi**



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Chief Editor

S. SRINIVASACHAR

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EDITORIAL

1975—A RETROSPECT

IN many ways 1975 was an unforgettable year for India—a year in which the Indian people have had to face and solve economic problems of unprecedented magnitude. Some of these problems at least were serious enough to distort the course of development for many years if left unattended. In devising solutions to them the leaders in Government not only sought to meet the imperatives of the moment but to attempt basic changes in people's attitudes, social values and institutional procedures. As we enter the new year and as the worst of the crisis promises to recede into the past we still see the frightening proportions of the task before us. What has however happened in the brief period since the declaration of the emergency is the beginning of a sea-change in the economic climate which only the other day looked so dismal.

We do not have to go far into the past to recall the circumstances that led to the unprecedented strains that India has had to suffer in recent years. The year 1971 is one we can never forget. That was the year of the Bangladesh crisis which brought 10 million refugees into India and forced a war on us. Even as India's cause was vindicated both on the battlefield and in international forums there came a new testing time with widespread drought and resultant fall in foodgrain and power output affecting both internal stability and industrial production. The intentions underlying deficit financing went belied because of poor performance on the economic front. Inflationary pressures started building up as a direct consequence.

Against this sombre backdrop one more blow came towards the end of 1973 in the wake of the world energy crisis following steep escalation in the price of petroleum. This forced the price-curve into a spiral and everything seemed to go out of control. From shortages to acute scarcity and from acute scarcity to hoarding, black-marketing and smuggling it was a natural step—so natural it seemed, that large numbers of affected people, particularly the poor, felt deprived and voiceless. It was a mystifying situation in which inflation, economic crimes, industrial unrest and political instability chased one another along a vicious circle. An atmosphere of despair prevailed in the economic situation of the country.

All this happened in 1975 and worse could follow. If today we reminisce on this in a somewhat relaxed atmosphere, we do so because of what the Government was able to do to arrest this down-hill run with consequences too dismal to contemplate.

We shall first look at the picture of inflation as it unfolded itself from 1971. The annual rate jumped from an average of 4 per cent in 1971-72, rose to 9.9 per cent in 1972-73 and touched 22.6 per cent in 1973-74. The first half of 1974-75 recorded the sharpest ever rate of increase in prices in post-war years, touching the peak in the third week of September, 1974 at 32 per cent! In the first half of 1974 itself the rate of inflation was running at about 2.5 per cent per month! This had never happened in living memory.

The First Measures

In these circumstances, fighting inflation became the foremost concern of the Government. A series of anti-inflationary measures were introduced in July 1974 under the Second Finance Act. The gravity of the situation can be realised from the fact that these measures had to be introduced soon after the regular

annual budget for 1974-75.

They consisted of (a) restraint in the growth of money supply achieved through economy in governmental expenditure and restrictive credit policies; (b) greater resource mobilisation through non-inflationary means to finance growth-oriented, core sector investment; (c) augmenting the availability of essential commodities of mass consumption through increased imports and strengthening of the public distribution system and (d) providing greater incentives for more production, higher saving and greater investment.

These measures were supplemented by putting restraints on private consumption expenditure through the impounding of additional wages and dearness allowance, curbs on dividends and other incomes. This was followed up by stringent action against anti-social elements under the Essential Commodities Act, the Defence of India Rules and the Maintenance of Internal Security Act (MISA) which was specifically amended in September 1974 to encompass smuggling activities.

As a result of the various anti-inflationary measures, fiscal, monetary and administrative—and the favourable market psychology created thereby, the rate of price inflation began to abate. The monthly rate of increase in the index of wholesale prices declined from 3 per cent in July 1974 to 2.6 per cent in August and further to 1.6 per cent in September. The wholesale price index (1961-62=100) after touching the peak of 330.7 in the third week of September 1974 took a downward turn and recorded a continuous decline upto the first week of April 1975 when it stood at 305.9. The annual rate of inflation (point to point comparison) which had risen to 32 per cent in September 1974 declined to 7 per cent by the first week of April 1975.

Revival of Speculative Forces

During the first few weeks of the current financial year however, the index again showed a rising tendency as a result of a revival of speculative forces following court decisions to release smugglers. Therefore it

became imperative further to plug the loopholes wherever they existed in the law-enforcement mechanism. By the end of June 1975 the index stood almost at the same level as a year earlier. Thus India became one of the very few countries to arrest inflation, an achievement which by any standard was the most spectacular.

The war on inflation received top priority in the New Economic Programme announced by the Prime Minister soon after the declaration of the Emergency. Besides holding the price line and intensifying the drive against hoarders and smugglers; the 20-point Programme also envisaged relief to the consumer through a reduction of income tax and strengthening of the public distribution system, particularly the arrangements for the supply of controlled cloth, and special provision for the supply of essential commodities to the weaker sections of the population. The combined effect of these measures was a further deceleration in the rise in prices. In the early part of November 1975 the general index was 4.6 per cent lower than a year ago.

While a check on effective demand and curbs on speculative forces can meet only the short-term exigencies the ultimate solution to inflation lies in increased production. Hence, measures to improve production both on the farm and factories were accorded a high priority in the New Economic Programme. Sluggishness in agricultural as well as industrial production was not entirely due to natural factors. A slowing down in the rate of investment in the economy and shortages in key sectors like irrigation and power combined with the increasing cost of imports put a heavy strain on our foreign exchange resources. The New Economic Programme took in its sweep all these problems and it is worth pondering on the effectiveness of the measures taken thus far.

Agriculture

Agricultural production increased at an average rate of more than 4 per cent upto 1970-71 following the severe drought of 1965-67. Since then it has been subject to large

fluctuations, declining during 1971-73, recovering in 1973-74 but again stagnating thereafter. According to preliminary information it is expected that in 1974-75 production of food-grains as well as some important commercial crops such as jute and mesta, oilseeds as well as sugarcane were below the level of production reached in 1973-74.

This stagnation in production was due, apart from weather conditions, also to the slow growth of irrigation, shortages and high cost of fertilisers, inadequate supply of quality seeds and credit. Under the New Economic Programme the outlay on medium and major irrigation schemes has been stepped up. Emphasis is now placed on a faster increase in the irrigation potential, maximum utilisation of the existing potential, easier availability of fertilisers at reduced prices and provision of credit in larger measure. For meeting the increasing requirements of quality seeds, the all-India seed producing organisations such as the National Seeds Corporation of India, the State Farms Corporation of India etc.

have been strengthened and a comprehensive seed development and production programme is being taken up with the assistance of the World Bank. Government have also effected a reduction in the price of fertilisers with effect from July 18, 1975, with a view to encouraging their offtake. The distribution margins allowed to the marketing agencies have been increased for the same purpose. Additional resources to the extent of Rs. 1230 million (over 1974-75 outlay of Rs 3570 million) have been provided to the States by the Central Government for enabling them to meet the resource gap in respect of irrigation projects.

Significant Expansion

The combined impact of the measures introduced in recent months, helped mercifully by the weather, has transformed the outlook for the economy during the year under review. According to the present trends, there is a likelihood of a significant expansion of national output. The declining trend

agricultural production has been reversed. Total foodgrains production in the year may be close to the targetted level of 114 million tonnes. The prospects for commercial crops except jute and mesta are also good. Agricultural production may register an increase of more than 7 per cent as against the marginal decline in the previous year.

Investment

In order to step up investment and industrial production, particularly, in the core-sector, the annual plan outlay for 1975-76 has been increased by 23 per cent over 1974-75. This was done through the mobilisation of a record level of resources through greater tax effort, fiscal discipline and economies in expenditures. The Central Government mobilised additional resources of the order of Rs. 6900 million. This effort was supplemented by a similar contribution of Rs. 3580 million by the States. The Central Government's additional tax effort was reinforced by the impounding of additional wages and dearness allowance and ceilings on dividends.

Annual Plan

In the Annual Plan for 1975-76 priority has been given to the key sectors, apart from agriculture and irrigation, such as power, fertiliser, coal, petroleum, cement, transport etc. The outlays on power and industry have been stepped up by 44 per cent and 50 per cent respectively. The addition to power generating capacity during the year is envisaged at 2.6 million kws., which is more than 10 per cent of the existing capacity. Super thermal power stations are to be set up in the vicinity of coal fields and preparation of project reports for four such stations has been expeditiously completed under the new programme. Within the four months since the declaration of the New Economic Programme, the shortfall in the availability of power as compared to estimated requirements was brought down to a bare 2 per cent while earlier it had been as much as 15-20 per cent.

Stimulus to Investment

A number of measures have been

taken to stimulate investment in the private sector and to ensure fuller utilisation of installed capacity. Several priority industries which were constrained by capacity bottlenecks have been permitted to expand their capacity upto 25 per cent. Industrial undertakings in 15 engineering industries considered important for the export effort have been permitted to grow at the rate of 5 per cent per annum over and above the normal permissible limit. Licensing provisions for medium and small entrepreneurs have been liberalised and 21 industries were exempted from those provisions, subject to the condition that they would not require imported raw materials, capital goods or foreign collaboration.

With increased availability of power, transport, steel and other inputs, including especially agricultural raw materials, higher rate of capacity utilisation and enhanced plan outlays, the rate of growth of industrial production is expected to improve significantly in 1975-76 against the estimated increase of only about 3 per cent in 1974-75, and less than 1 per cent in 1973-74. The available data for certain selected industries indicate even more substantial improvement in output during July-September 1975 over the same period last year. For example, the production of vanaspati, nitrogenous fertilisers, aluminium, copper, lead, scooters and vehicular diesel engines, went up by 20 per cent. Production of coal, saleable steel, cement, petroleum refinery products, etc. increased by between 10 and 20 per cent. On the other hand, output of cotton yarn and cloth, cars, jeeps etc. declined due to certain special factors which tended to depress the demand for these products. The overall rate of growth in the public sector undertakings during the first six months of 1975-76 is estimated to be of the order of 19 per cent over the same period last year.

Public Distribution

Till such time as supply of essential commodities becomes abundant, an effective public distribution system has to be maintained both as an instrument of price stability and social

justice and especially to protect the vulnerable sections of the society. Accordingly, greater attention has been given to regulating supplies of essential consumer items through a network of fair price shops—consumer cooperative stores etc. These outlets handle foodgrains, sugar, controlled cloth and other articles of daily use. Not only supplies were assured to the consumers through these channels but efforts were made to keep the prices at reasonable levels. A full-fledged Department of Civil Supplies has been set up at the Centre to keep a constant vigil on this area of public policy. The sole agency system in certain items was abolished primarily with a view to reducing distribution costs and trade has been required to display prices and stocks.

Social Justice

As part of the programme, more earnest effort is being made to expedite the implementation of land reforms. The progress in the implementation of agricultural land ceilings and distribution of surplus lands to the landless has been rather tardy in the past. As a first step, the completion of land records is being expedited. The redistribution of surplus land has also been accelerated in recent months.

Another important step taken under the programme was to attack the perennial problem of rural indebtedness which perpetuated the low consumption levels and low productivity of the rural poor. The State Governments have declared a moratorium on rural debts in the first instance. While debts of the very poor like landless labourers are being completely liquidated, the debts of other weak sections are being scaled down according to the repaying capacity of the debtor. Many States have made it obligatory on money lenders to register themselves with the government. Since these measures are likely to reduce the availability of credit to the rural poor, the cooperative societies and the newly set up regional rural banks are expected to fill this gap. Five regional rural banks have already started functioning from October 2, 1975, out of

50 such banks which are proposed to be set up. These banks will advance loans particularly to small and marginal farmers, agricultural labourers, rural artisans etc. at concessional rates of interest. Simultaneously, Government has abolished the pernicious and primitive institutions of bonded labour widely prevalent in the country through a Presidential Ordinance.

House Sites

The State Governments have either initiated or completed legislation to revise the minimum agricultural wages to make them commensurate to the cost of living. Another important measure in this direction is the provision of house sites for the landless and other weaker sections. The Panchayats and local authorities are being placed under an obligation to provide house sites where such sites are common property. The State Governments are also required to make available for the purpose land already at their disposal or obtained through the implementation of ceiling laws or acquisition. It is reported that 3.25 million sites have already been allotted to the landless labourers in the various States.

Labour's Say in Management

To improve industrial harmony and raise productivity, the New Economic Programme envisages that labour should have a say in the management. Towards this end, the State Governments have been asked to constitute shop councils at the shop-departmental levels and joint councils at the enterprise levels, comprising representatives of employers and employees. The public sector units have been required to take a lead in this matter. A new spirit of harmony has pervaded in industrial relations after the declaration of the Emergency and the launching of the new Economic Programme.

Employment Opportunities

In order to increase the employment opportunities for the increasing backlog of the unemployed, particularly the educated youth, government have strengthened the appren-

ticeship scheme, under which, all available training places of trade apprentices are expected to be filled. More than 96 per cent of the vacancies are reported to have been filled within a period of three months. Government have also decided to enact a law to prevent unjustified lay-offs, retrenchments and closures.

Export Earnings

The country has faced a formidable payments problem in the past two years, chiefly on account of a deterioration in its terms of trade, in particular, owing to sharp increases in the price of petroleum and petroleum products. Although export earnings recorded an impressive growth of about 31 per cent during 1974-75, the country had to contend with a huge trade gap, as imports increased much more than exports (i.e. by about 51 per cent), largely due to the high costs of crude petroleum and petroleum products, food and fertilisers. Further, a declining tendency was observed in exports in the first few months of 1975-76 (mainly due to the recessionary conditions prevailing in the developed countries) which caused great concern. Provisional data for April-September 1975 indicate a rise of 14.3 per cent in exports and 22.2 per cent in imports over the previous year. The trade deficit during the period was thus about 50 per cent larger than that of about Rs. 4170 million during the same period last year. The prevalence of recessionary conditions abroad has visibly slackened exports, while the latest hike in oil prices would considerably add to the import bill.

A package of export promotion measures has, therefore, been introduced in recent months to boost exports. These measures include delicensing of about 190 items of exports, exemption from duty and materials imported against advance licences subject to export obligation, removal of export duty on certain items, liberalisation of export credit, simplification of disbursement procedures for cash assistance as well as extension of cash support to several non-traditional and traditional export items.

All these measures are expected to contribute to a higher rate of growth in exports in the near future. It will no doubt be some time before the full impact of these measures is felt; however, of late, there have been some favourable developments in the balance of payments. There has been substantial increase in the country's foreign exchange reserves in the last few months. This is partly due to drawals on IMF oil facility of the order of Rs. 2920 million and partly due to a higher level of private remittances from abroad as a consequence of curbing smuggling activities and a drive against black money.

To accelerate this process, Government have adopted a scheme to encourage the flow of funds from non-residents of Indian nationality or origin. Under this scheme, such persons can remit funds to India and maintain accounts in the currencies in which the remittances are received. Government have also liberalised the provisions for the repatriation of investment by such persons. With a view to imparting greater stability and realism to the external value of the rupee, the rupee has been delinked from the pound sterling and under a new arrangement it is pegged to a basket of selected currencies. Its exchange rate is now determined with reference to the daily exchange rate movements of the currencies in the basket. The pound sterling will, however, continue as the currency of intervention.

Sustained Hardwork

India's success in achieving stability in the price level in increasing agricultural and industrial production and in facing the problems of external payments, is a matter of satisfaction. The fact that those achievements have taken place in an atmosphere of harmonious industrial relations and a new emphasis on discipline augur well for a faster growth of the economy. However, if our past experience as a free nation is any indication, all the good work done so far will come to little if complacency and apathy are allowed again to undermine our sense of unity and commitment to progress. □

WORKING CLASSES AND THE NATION

The one is integral part of the other. The enormity of India's problems and the compulsions of speedy development do not permit accentuation of prevailing social injustices by allowing the few to benefit at the cost of the many. Nation's future is irrevocably tied up with uniform development and the uplift of the backward regions and communities in particular.

INDIRA GANDHI

WE all know that any country aiming to be modern would have to industrialise. Therefore, the labour force becomes the backbone of the nation. Their production becomes of the utmost importance to all sections of the people. And because in order to have better production and also because of our concern for the welfare of all our people, we are also anxious that the workers should get a fair deal in every sense of the word.

All of us are convinced that what are called the commanding heights of the economy should not be in the hands of those who exploit the situation for the benefit of a few but should be in the hands of the State which can use the resources for national programme. This has been our endeavour. But we also know that quite often when the Government takes over an industry or a unit, much more is expected from the Government than from the previous owner, so much so that losses increase and Government's capacity not only to help the wor-

kers of the particular unit but to deal with unemployment and other allied problems is decreased.

We have been through an extremely difficult economic situation. It is not hard for us to analyse why it has been so. In the developed world during the earlier stages of the industrial revolution workers were exploited including women and children. Authors who wrote about the earlier stages of industrialisation in the West, have written about children being blinded because they rarely saw the sun, having had to work in mines from dawn till sunset and so on. There was no demand then for equal rights, for any kind of amenity, or any kind of equality. It is when the need arose for more skilled labour, for more complex machinery, that the question of education for the common man arose. With education came greater understanding, and the ideas of equality, welfare and so on came to the fore. But by that time the industries and the economies of these countries had attained a firm base in the lives of their own people. They had also the advantage of access to the cheap labour and natural resources of a

number of colonies which these industrialised countries acquired overseas. So by the time the demands for justice rose amongst their own workers, they had the capacity to meet those demands. But in India, as perhaps in all developing and newly freed countries, this traditional process was reversed because we were under foreign rule.

Our first objective was necessarily to be rid of foreign rule, to have a government which would be more alive to the problems of the nation, which would be more concerned with the raising of the level of the people. So all sections of the Indian people joined in our mass struggle and we succeeded in it. While we were struggling for political freedom we were also conscious that political freedom is not in itself an end. Our leaders were fully aware that freedom could be real only if it brought a better deal to those who had been the most under-privileged, the most oppressed. This needed a vast social and economic transformation of our society.

Above all, it called for a reasonable degree of self-reliance on our part, so that we should be able to produce

Based on her address at the INTUC Meet on November 15, 1975

many of the things which we need and not be dependent on outside help. In today's world, however, no country can be fully self-reliant. There has to be an inter-dependence between the countries. But inter-dependence must be based on the full independence of each individual country. The great importance of self-reliance is that it provides for increasing our production. Because of the great poverty of our people we did not want to pursue the easier and more straight path of economic growth which might involve great hardship for the people because we have all along chosen to consider the question of social justice along with economic development.

We had also to consider how to produce in our own country the many articles which we were importing from abroad. When we became free our capacity for this was obviously extremely limited. In the process of Indianisation, of giving greater opportunities to Indian industry, an imbalance was created and those who had the know-how, the capacity, did become much richer and much more powerful. Although little by little the entire industrial base has expanded and has been diversified with many young and other entrepreneurs in the field, I am afraid the basic situation has not yet changed.

The Detractors to Smooth Progress

In the meantime, we are confronted with different kinds of obstacles and difficulties. There is opposition from those in the country who do not approve of the direction we have chosen. There is opposition from their collaborators in other countries. There is also the fear on the part of the average man for any kind of change. The economic situation has been influenced not only by the burden of repeated aggressions from outside, but by natural calamities of great proportions and pressures from outside, not to speak of the impact of the international financial crisis which includes the fuel crisis. Now all these things created a situation in which we had very little manoeuvrability. Any parent or, for that matter, any per-

son in charge of anything may want to do the best for their children or ward but what they do is obviously limited by the resources they have for the purpose.

We, as a Government, are committed to the welfare of the working classes. This is not only a human problem, but it is an economic problem. We are deeply conscious of the human side of this problem. We need the cooperation of the working classes to make a better India, to provide the goods that are needed for our defence, for our agriculture, for our daily lives. There are no two opinions on this. While the working classes have many hardships, we shall all have to appreciate that we have a much larger proportion of the population which is much worse off. There is the problem of the unemployed who are in large numbers. There are also large numbers of people who may be self-employed in the rural areas but who do not enjoy many facilities. Even though the facilities enjoyed by the working classes now may not be sufficient, there are many who do not have even these facilities. Therefore, what we do for the working classes has to be balanced with what has to be done for the others. Those who today form the labour force are not separate from the others; they are part of the Indian population. Each one of us—whether it is the Prime Minister or the Ministers of leaders in other fields, the working people or the farmers—we are all first and foremost citizens of this country; and we have found not only in theory but in practice through our experience that when each section wants to fight only for its rights ignoring the situation in the other sectors, that creates and imbalance and disharmony. Ultimately it will not even help those very people who may struggle for and wrest some advantages from the Government or from the management of the concerns where they work.

I am not saying that there is no injustice. We know that there is. There have been several reports of lay-off taking place. We know that some of them are not justified. We know also that these are cases where provident fund of the workers has been used for other purposes.

There are other similar cases of injustice, of callousness or negligence and these must be dealt with firmly. There is no doubt about that.

But if just the wages or the bonus or some other amenity of the workers increases, we must also think of the consequences of such a thing on the rest of the country. *I should like to know whether there is any other country in the world where a losing concern gives bonus to its workers. I have met the leaders of labour from the communist countries, the countries which call themselves socialist and they have asked me: 'how can you do this? How can you expect your industry to grow, or your society to change if you do this?'* People have come to advise us on specific industries and they have pointed out the anomaly that in our strong desire to do something more for the working classes we have taken steps which in the long run are not in the interest of the working class itself. The other day while talking to farmers I said that as the parent or the guardian one should not merely see what the child wants at any particular moment, but see how it will help the future growth of the child. Every section would like to have higher wages and I know that they deserve it. *The Indian working class, inspite of all the difficulties and injustices, have worked hard. They have stood by us in times of difficulty, in times of crisis, in times of wars or natural calamity and we appreciate this solidarity which they have shown.*

But can they consider themselves a class by themselves, ignoring the needs of other sections of the people? This is a question which organised labour should ponder over. Certainly, if they want to discuss their problems the Government is always available for discussions. I am one of those who have always discussed and who have always been willing not only to meet people like workers who have been friends and colleagues and supporters but even those who have strongly opposed me, or even threatened me.

Every problem has to be viewed in the larger perspective. What do we want to happen in our country?

What sort of a country do we want?

We have heard a great deal about democracy recently. But democracy has been a changing concept. When it originated, democracy meant the liberty of only a few people who were called citizens, whereas the vast majority in Greece were still slaves. In the early stages of democracy in England they were not bothered that the vast numbers of people in their colonies had no rights whatsoever, or even their own industrial workers, mine workers had no rights. So it is little by little that the concept of greater participation has grown. But here we started with the concept of everybody's voice, everybody's demands being heard. And we have done our best to hear those demands and to meet those demands.

One of the problems in India is the multiplicity of unions. I don't know how many times the unions have considered the genuine needs of their workers in preference to: "shall we not put forward a higher demand than the other union because thereby we will be more popular?" I would like to say a word about popularity. Had I wanted to be popular, from the beginning, to those forces which are very powerful in this country or in other countries, I could just have said: "Well, we will do what you say" and we would today not be facing the crisis which we are facing all over the world in every international forum. On the other hand, we said, "it is all very well to be popular, it is nice to have friends, but this is something we cannot afford as it costs us the welfare of the majority of our people, our right to make our own judgment, and to chart our own course." Because we stood solidly by our policies and principles we ran into all these difficulties, both within the country and internationally. We are preparing our people to face these difficulties because we believe that it is by facing them that freedom will become real.

We only used to talk about all these things. But today what has happened in other countries proves that dependence on another country can never strengthen any one. Somebody has said that the freedom that springs from suffering by others is not freedom. So our revolution, whether it is the political revolution or the economic revolution or social revolution is incomplete and today it is our effort to move towards its completion. I do not know whether we can accomplish it in our lifetime. Probably not. But we can certainly proceed at a rate which strengthens our effort in that direction. If we

find at any moment that we have taken a wrong decision we have had the courage to say that this was a wrong decision, and take corrective action thereafter.

I personally feel that the whole pattern of development undertaken in most of the world is the wrong pattern of development for India to copy and that if we go along those lines, we shall never be able to reach out to the poorest in our land. Today in the affluent countries, more and more is being spent on less and less people. We find somewhat the same pattern in our own country also. As medicine becomes more sophisticated, more and more doctors want to go for specialisation. And they are amongst the tops in the world, I have no complaints about that. But that kind of specialisation is useful only to fewer and fewer people, whereas the mass of the people are by and large denied even the basic health measures which are their due. The same can be said of education and I think the same can be said of industry. While we realise the great importance of heavy industry, of large industry in a country with our circumstances, we cannot afford to neglect the small-scale industry, the village industry, the handicrafts. Otherwise, vast sections of the people will not benefit from any economic advance that we make and this is exactly what has happened. It is not true that this country has not advanced. You have only to go round every where to see the tremendous, almost spectacular advance which we have made and yet there are large pockets of dire poverty. This is so because it was a one-directional advance. Now if we don't stop and think and see how we can change this pattern, we may never again get another opportunity to do so.

Our past experience calls for re-thinking on how we should go about.

Today we are at a stage when we can take another look at these things. We have to consider how we can avoid the pitfalls of the affluent countries. We cannot compare our advance to the advance of some of the small newly freed countries. We have only to think of our own population to realise the immensity of the task. The other day when we had the Conference of the Commonwealth Parliamentary Association, there were almost over 40 countries represented and we found that the total population of all the countries represented there was less than one-third of the population of India. My own home State of U.P. has a population of over 90 million people. It is much

bigger than most of the countries of the world. So our problems have to be seen in this context. We can never say: "well, if we are in trouble, some country will bale us out. It cannot. No country, even the biggest or richest in the world, has the capacity to bale us out. They can bale out the United Kingdom, if they want to, they can bale out other countries in Europe as they do from time to time or some small countries in Asia, but nobody has the capacity to bale out a country like India. It is only we, the Indian people who have the capacity to do it and who have the will to do it.

So far we have welcomed outside help but it has been less than 20 per cent of our total needs. i. e. 80 per cent of the burden of development has been borne by the Indian people. They may be poor, and illiterate, but they have borne the burden of whatever development has taken place and this progress has been considerable by any standards in the world.

This burden is an increasing burden and we can continue to bear it only if the working classes also see their problems in this larger context. Where do the working class come from? After all, they come mostly from the villages, too. They have their relatives, they have their families in the rural areas. So it is important to them also that the level of the rural areas should rise. Industry can prosper only if there is this understanding. It can prosper only when there is harmony and peace in the country. And that is why in all our policies whether it is towards the minorities or general economic development this constitutes one of the most important points to be considered. Harmony can be maintained only if a better balance is maintained between different sections of the people. Today there is imbalance because we all know there is a small section which has not only benefited in the past but is benefiting even today. The object of the system of controls and licences was to control this imbalanced growth but we know also that it has not succeeded fully.

It is obvious that industries cannot be allowed to grow without control. They have made enough profits already and we must see that what they make is directed towards the general good and not for private benefit. But all these things need re-thinking and we need to find a new path which can bring about a better balance.

We are all for liberty. We are all for freedom of speech, freedom of association, freedom of expression and so on. But if that freedom

becomes licence—it is difficult to say which is the dividing line except when freedom of the few affects the advance or the welfare of the many. And this is just the situation we have seen in India, because when we try to curb the bigger industrialists, they also say we are curbing their freedom, their freedom to grow. But you will all agree that that freedom affects the workers' freedom and therefore we have to do something so that their freedom may have to be curbed in order to maintain the freedom of the workers.

We have started land reforms. Even in capitalist countries, even, for instance, when American presence was there in Japan, one of the first things that General MacArthur did was to bring about land reforms. It was not a socialist society but everybody in Japan knows that land reforms made a big difference to their national development. There are other countries, equally far from socialism, who have brought about land reforms. But in our country we are finding it difficult. In several States, there are land reform laws. But the whole process of land reforms, the giving of land to those who deserve it and to those whom we promised it had some how come to a stop. I am just citing one or two

examples. But there are thousands of them like this in every field of activity. A few people cannot be allowed to stop the growth of the country or deny the rights of the many. This is the basic point in democracy. *The basic point in democracy is the participation, of every individual in the development process of the country including policymaking. This is the type of democracy which we are attempting to bring about. This is not going to come overnight. But little by little, we now see that the people do have a greater appreciation of it. This has nothing to do with literacy or formal education. It is a question of understanding of problem and a concern for one's nation.*

When liberty was being construed as licence, we had problems in every sphere. In the sphere of industry, last year alone, we lost, I am told, 3 million mandays. This year, the figure has come down to 1 million. Even the loss of one million man-hours is much, though this marks a great improvement over the previous year. We must all see that conditions are created whereby this figure goes down still further.

I am not minimising the problems faced by the working classes. I am not minimising also the fact that the

managements take advantage of these difficulties sometimes. But we have to consider them in the larger perspective. We do not want any injustice. We want better working conditions, greater participation of the workers, and even of women workers. If the nation cannot stand up to its difficulties, even if the workers get some rights for themselves, how long will they last if the nation is not strong enough to protect itself, to protect its general economy? If inflation continues to gallop as before, what is the worth of the bonus or the salary or anything that people may get? If the value of the rupee falls, and is worth only a few paise, does it matter if one gets 100, or 200 or even a thousand?

For instance, the farmers are continuously saying that many of the Government decisions—preventing the accrual of a higher price, for grain went against their interests. In some places the price has been increased so much for certain articles that we are now not able to export it. Other countries have taken over where we had a good foothold. Now the farmers are complaining, but all the time they were shouting that the Government was unfair.

So all these problems have to be considered in this larger aspect. □

Silkworm rearing—A new approach

JYOTEESHWAR PATHIK

IN Jammu Province, one of the main centres of silk worm rearing in Northern India, a rearer earns on an average Rs 300 per mensem by rearing silk worms and selling cocoons to the Sericulture Department. At present ten thousand families living in 1,242 villages in the Province are engaged in silk worm rearing industry to produce 340 tonnes of cocoons annually. This is purchased by the Sericulture Department for about Rs. 36 lakh.

There are at present 20 main silk worm rearing centres spread over Jammu, Kathua, Danga (Bani), Sunderbani, Nowshera, Rajouri, Poonch, Udhampur, Ramnagar, Mirchulna, Katra Dudo-Basantgarh, Arnas, Serh, Gool, Banihal, Doda, Kishtwar and Budhal.

An analysis reveals that out of one ounce of seed 75,000 worms hatch to spin cocoons and each cocoon weighs 2 grams. In other words, if all the silk worms spin cocoons, the total cocoon production from one ounce seed will be 150 Kgs. But the Sericulture Department records have shown that only 16 grams of cocoon production is being achieved on an average from one ounce

of locally produced seed. That is, out of ten silk worms only one spins cocoon and the mortality percentage is 90 per cent. This is alarming and requires immediate serious attention if the silk production is to be increased and the lot of the silk worm rearer is to be improved besides attracting more villagers to silk worm rearing occupation.

According to an expert four factors are responsible in silk worm rearing: temperature, humidity, nutrition and space. To ensure increase in production these factors need to be attended for creating the necessary environment.

The Sericulture Agency proposes to launch a campaign—"Save Silk Worm" to reduce mortality rate among silk worms and ensure increase in cocoon production. This campaign is scheduled to be launched during April 1976 with the onset of the rearing season. Rearing is done in two phases. First phase starts on February 7, while second phase during third week of April every year.

Many a step is proposed to be taken for this purpose. Firstly number of eggs in a unit of silk worm

eggs will be rationalised; each ounce of silk worm eggs will contain 40,000 eggs instead of 75,000. Secondly, the rearing zones will be studied for re-organisational purposes by providing expert and technical know-how of silk-worm rearing. Thus, statistical data of each zone and village will be collected. Study of the rearing in each house will be done on scientific lines and analysis of the behaviour of the egg is to be recorded for further guidance regarding suitability of race of silk worm in particular zone. Farmers' houses will be disinfected with a mixture of lime and bleaching powder. During rearing operation colonies of silk worm rearers will be dusted with germ-killer. Dusting operation will be carried out at the termination of 3rd and 4th month.

Spade work of the campaign will be two fold. Firstly the recording of number of mulberry trees available in a zone, lead yielding capacity of trees in different zones, number of rooms available in a house, area of walls to be white-washed and quantity of germs killer required for disinfection. Secondly the silk-worm rearers will be educated with the assistance of various agencies such as social workers and panchayat staff besides school teachings and members of the legislature. □

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Wealth From Waste

ARECANUT HUSK

Arecanut husk is an important byproduct which is now practically going waste. This raw material can be used in the manufacture of a variety of products like hardboards, paper, insulation wool, etc.

O. P. VIMAL

ARECANUT is an important plantation crop covering an area of about 168 thousand hectares and producing 152 thousand metric tonnes of nuts. During the dehusking of the nut, the husk is obtained as a byproduct. From these nuts, about one million metric tonnes of husk is annually available in the country. It is concentrated in three states i.e. Karnataka (37.4%), Kerala (35.5%), and Assam (19.3%). The maximum quantity of the husk is particularly available in certain areas such as Malabar-Kasargod in Kerala State and Shimoga, Chikmagalur in Karnataka.

Chemical composition

The husk contains about 65 per cent cellulose and 27 per cent lignin. Hot water extractives amount to 17 per cent and ash content 4 per cent. The plant nutrient content is very low in the husk.

Uses

Potentially arecanut husk can be utilized for the following purposes:

1. Hardboards
2. Paper
3. Insulation wool
4. Plastic materials
5. As a source of furfural
6. Agricultural uses
7. Other uses

Hardboards: Arecanut husk compares favourably well with wood and straw in its chemical composition and as such can be used for making hardboards. The work done under the scheme sponsored by the Central Arecanut Committee at Forest Research Institute, Dehra Dun clearly showed the possibilities of making low density fibre boards and

high density hardboards. Arecanut husk fibre boards produced by a variety of processes (cooking with caustic soda, lime, defibration) had satisfactory properties and offer possibilities for industrial production. Boards prepared by simple spraying of the husk with 7 per cent caustic soda salutation followed by defibration gave boards with a modulus of rupture of 400 kg/cm² and a water absorption of 18 per cent (after tempering). Thus, these boards are comparable to the hardboards available in the market showing high bending strength, low moisture absorption and swelling properties. However, it may be added that although the experimental findings did justify undertaking pilot plant trials, the matter was not pursued further at that time.

With the rapid development of housing programme and the need for substitute for wood wherever possible, the development of hardboard industry from sources such as wood waste, straw and arecanut husk appears to have encouraging possibilities. The most important factor in the commercial exploitation of arecanut husk is the availability of the material at reasonable prices at the mill site. Moreover, keeping in view the bulky nature of this waste, the baling of husk for transport as well as the storage problems also need to be considered. It is hoped that with a good working arrangement between the growers and processors of arecanut and the mill, the cost of the raw material at the mill can be made competitive with those of woods suitable for hardboard making. A hardboard factory worked on a co-operative basis by arecanut growers and processors may also be a very desirable proposition to consider.

Paper: Like other cellulosic materials, arecanut husk has also

been considered as a raw material for paper making. Early attempts showed that pale buff coloured paper of low strength could be made from arecanut husk. Later work carried out at the Forest Research Institute, Dehra Dun under a scheme sponsored by the Indian Central Arecanut Committee showed that brown wrapping paper can be prepared from arecanut husk if mixed with bamboo and jute pulps. Further results obtained by adopting semi-chemical pulping processes (like cold soda or neutral sulphate process) revealed that arecanut husk pulp prepared by these processes was too weak to be of any use in industry.

Insulation wool: Wood wools find application in various industries, for packing, thermal insulation and acoustic correction. Experiments carried out by Narayanamurti indicated that a satisfactory wool could be produced by beating the airdry husk of arecanut. Such a wool was found to have a thermal conductivity of 0.0394 kcal/m h at a density of packing of 0.08 g/cm³. Treatment with sodium thiosulphate under suitable conditions of temperature rendered it resistant to fungi and termites. The arecanut wool compared favourably well in respect of density of packing and thermal conductivity with foreign products such as granulated cork and defilrated teak bark (*Indian Forest Leaflet* No. 112, 1947).

As a source of furfural: Furfural is a chemical of great importance for a variety of rapidly developing industries, like petroleum, nylon, vegetable oils, plastics, synthetic rubber, resins and for the preparation of many other economic products (Yojna 19 (12) : 21-22, 1975). Arecanut husk contains about 28 per cent pentosans which are the precursors in the production of furfural. Pilot plant studies conducted at the Forest Research Institute Dehra Dun indicated a low yield but in this case the quantity of charge employed was rather low. So, further work is necessary to come to definite conclusions. The residue of the furfural distillation was found to be suitable as a filler for P.F. resins.

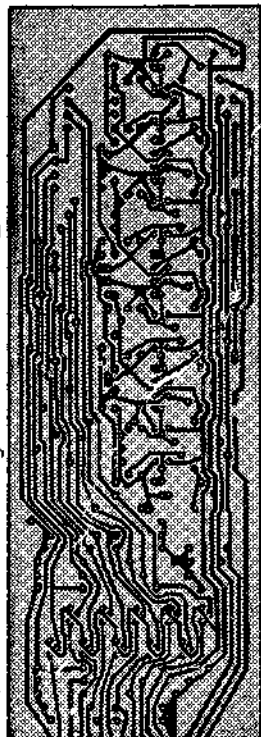
Plastic materials: Studies conducted on the utilization of arecanut husk at the Forest Research Institute, Dehra Dun under a scheme sponsored by the Indian Central Arecanut Committee, it was shown that plastic materials can be obtained from arecanut husk by condensation with chemicals like aniline, cashewnut shell liquid, furfural and sulphur. Ther-

Dr. Vimal belongs to the division of Soil Science and Agricultural Chemistry, IARI, New Delhi

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mal plasticization with 15 per cent phenol in the presence of water gave the best results. The dimensional stability of the plastic boards was also satisfactory with 10 per cent CNSL, 10 per cent sulphur and 10-15 per cent carbon di-sulphide. Treatment of the boards with 2 per cent sodium thiosulphate rendered the specimen free from fungus attack (Narayanamurti, D & Jagraj Singh—Final Report, F.R.I. Dehra Dun).

Agricultural uses : Arecanut husk is a lino-cellulosic material, so it decomposes very slowly in the soil. However, keeping in view the large availability of husk in certain areas, it can serve as a local material for manurial purposes; but this would require inoculation with efficient microbial strains which can decompose this resistant material. The CPCRI's Regional Station Vittal has initiated some studies on the microbiological decomposition of these wastes by using *Mycrothesium*, *Trichoderma* and *Pestalotiopsis*.

Other uses : Arecanut husk has short, thick fibres. This may be used in the manufacture of rubberised mattresses in admixture with coir. Some preliminary studies undertaken by CFTRI, Mysore showed the possibilities of making soft boards, cushioning materials and activated carbon from arecanut husk. Though these investigations indicated encouraging results, further work was not undertaken on these aspects. Arecanut husk can also be used as poultry feed.

From this brief account, it is evident that a good deal of research work



IGNORAMAN

wants to know

whether International Women's Decade will eventually grow into International Women's Century.

has been sponsored at various Institutes on the utilisation of arecanut husk but despite encouraging results, this waste has not been put to any commercial use at the moment. Keeping in view the production and consumption pattern of arecanuts during the last decade, it would be clear that after a boom price of 1970, the prices have been steadily falling, thus adversely affecting the cultivation of this crop. Moreover, with the coming into being of newer plantations and adoption of intensive agricultural practices, the production

of arecanut is likely to increase steadily in the near future. Therefore, in order to sustain the cultivation of this crop, efforts will have to be intensified not only to find alternative uses for arecanut other than chewing but also to commercially exploit the wastes/byproducts available from this crop.

With a view to making the best and maximum use of arecanut husk, it would be worthwhile to prepare a feasibility report. This should include the following aspects:

1. Maximum availability of arecanut husk region-wise so as to assess the possibility of centralised collection.
2. Level of technical know-how available for the manufacture of various commercial products from arecanut husk.
3. Comparative economic studies on the cost of production of various end products.

To start with, Karnataka/Kerala offers the most potential field for this study as arecanut is the major plantation crop of this region. Moreover, the growing of this crop is well distributed in all the districts of these states e.g. in Kerala, the percentage of total nut production district-wise is as follows: Malappuram, 17.5; Trichur, 15.7; Cannanore, 14.6; Quilon, 12.9; Calicut, 11.5; Ernakulam, 8.7; Alleppey, 5.8; Trivandrum 5.8; Kottayam, 4.0 and Palghat, 3.5. The results of this survey may be followed by studies on other states i.e., Karnataka and Assam.

Vast Network to Promote Family Planning

Immunisation services under the family planning programme are to be provided both to the rural and the urban children.

Arrangements for maternal and child health care, immunisation and prophylactic treatment have been made in all health and family planning centres in the country. All these services are available free of cost. Immunisation services like the triple vaccine are meant for children in rural as well as urban areas.

There are 5314 Primary Health Centres in the country today, while the rural family welfare planning centres number 5204. As health and family planning services have now been integrated each of the centres, sub-centres and dispensaries will provide expert advice on family planning, mother and child health care and immunisation. Each one of these health centres is supported by a number of sub-centres which number 32,689 each catering to about 10,000 of population while primary health centres give composite services for an average population of 80,000. The rural family welfare planning centre is also attached to each primary health centre.

The primary health centre generally

has two qualified doctors assisted by various para-medical staff. And both the doctors render all the services, while the key figure in a sub-centre is the auxiliary nurse midwife. There are at present 31,000 auxiliary nurse midwives in the country.

The two medical officers one of whom is expected to be a qualified lady doctor, provide prophylaxis against nutritional anaemia among mothers and children, immunisation of infants and pre-school age children against diphtheria, pertussis and tetanus, immunisation of expectant mothers against tetanus and prophylaxis against blindness in children caused by vitamin 'A' deficiency.

In certain areas where children are found to be suffering from night blindness, because of deficiency of vitamin 'A' in their diets Vitamin 'A' is supplied to be included in their diets. Vitamin 'A' preparations are also distributed free to the needy children by the health centres in these areas.

To fight anaemia in women of child-bearing age and children, iron and folic acid are supplied free of charge from all health and family welfare planning centres.

On the family planning side the primary health centre has clinical servi-

ces for loop insertion, diaphragm fittings, pelvic examination of cases as well as follow up services for post-operative cases for users of oral pills or conventional contraceptives. All types of conventional contraceptives are available at the primary health centre.

Sub-centres give advice on the use of different contraception methods and distribute conventional contraceptives. Auxiliary nurse/midwife goes round the area covered by her sub-centre visiting homes, counselling and guiding the people.

She renders prenatal and postnatal services, performs domiciliary delivery, gives general information about family planning methods and supplies conventional contraceptives.

Family planning services are available at all major dispensaries and hospitals. In addition, mobile service units attached to the District Family Planning Bureaux provide sterilisation and IUCD facilities in remote areas of the country.

In the urban areas there is a family welfare planning centre for every 50,000 or lower population range. There are at present 1,908 such centres, 1213 of them being run by the State Governments.

WESTERN PRESS AND

Recently UNESCO made public its survey of mass media in 200 countries. The survey revealed quite a few unsavoury truths. Among them is the fact that though there are national news agencies in 90 countries, most of them depend on five world news agencies to transmit news about their countries to other nations. Obviously, the people in those nations are fed on news as seen through the eyes of monopolists.

This is borne out by another truth revealed by the survey, namely that news reports on other countries in the popular newspapers and T.V. and radio stations of most countries show an imbalance; they project sensational and bad news and "eccentric and unrepresentative" aspects of life.

Unrepresentative Organisation

In an article in the *Guardian Weekly* (6 Sept. '75) its Chief Correspondent in Asia, Mr. Martin Wollacott, bemoaned the attitude of the Western press towards the developing countries of Asia and Africa. After listing the defects it suffers from, he said that the international news gathering organisation as represented by the Western press corps is, even in Western terms, "an unrepresentative organisation, dominated as it is by the big American and British news agencies, newspapers, magazines and broadcasting organisations".

Barring a few exceptions, the main trouble with the Western press is that its correspondents concentrate on bad news. An instance quoted by Mr. Wollacott is worth recalling. In Philippines few Western reporters visit the model land reform projects in Luzon province but hundreds of them have visited Mindanao to cover the war between a secessionist group and the army.

Wishful Thinking

The Western newsmen also indulge often in wishful thinking. For example, the Western reporting of Vietnam, the debacle of Western stooges, has been greatly and most unrealistically concerned with projecting the idea that there could be serious clashes between Hanoi and the Government of South Vietnam. As a matter of fact the two are well on the way to achieving the goal of a United Vietnam.

A few exceptions notwithstanding, the Western Press has developed a habit of looking at events in developing countries with jaundiced eyes. Even where facts are crystal clear it likes to look at them through coloured glasses, and report them with exaggeration and distortion.

India has been a victim of this attitude and the Prime Minister has often spoken of the lack of objectivity on the part of the Western Press.

In the words, of a Filipino information official, "It is as if Western reporters feel their job in any developing society is to identify that society's weakest points and then make them worse by exaggeration and unremitting publicity". They are interested only in reporting famine, war, corruption and governmental incompetence (real or imaginary) and what they think is repression.

Instrument of West's Power

By and large, the Western press has created the impression of being an instrument of the West's political and economic power in the same way as Western diplomats, big business and armed forces. And by its record of reporting over the years, the Western press corps has created the image of a hostile institution. To quote Mr. Wollacott, "In this picture, Reuters, the Associated Press, the *New York Times*, *Le Monde*, the BBC and all the rest of them are seen not as separate and diverse organisations but as elements in a system of cultural imperialism which gathers and interprets world news according to Western interests and values and then transmits it back to non-Western societies, overwhelming their own news and propaganda resources".

Obviously, this attitude arises out of the Western assumption that they are still the ultimate arbiters of the rest of the world, a reincarnation of the white man's burden in the nuclear age.

Writing in the *Washington Post*

(September 1975) Mr. Clayton Fritchey exposed the West's lack of objectivity in reacting to the events in India. Mr. Fritchey said: "...There can be no balanced judgement on the crisis in India without some understanding and appreciation of the provocations that inspired it. So far all the sympathy in America has been reserved for the opposition forces in India.... On the other hand there has been no condemnation of the anti-democratic, irresponsible, illegal efforts of opposition extremists to overthrow Mrs. Gandhi by extra-parliamentary 'means...'"

Case Study

A glimpse of the attitude of the Western media in general and the press in particular towards the events in developing countries can be had from the opinions expressed in the Afro-Asian press on the Western reaction to the recent events in India. A study of the cross section of such opinions serves as a case study.

In a recent article entitled "Let us be fair to India" in the Turkish newspaper, *Daily News* Dr. Turkayya Ataov has criticised the anti-India campaign being carried on in the Western press. He said that there is ample evidence to show that the American and British millionaire press cherish sympathy for anti-government forces supporting Indian big business. "These forces are the remnants of feudalism, and in the last analysis, of neocolonialism, against which India has been waging a battle".

Dr. Ataov added: "There was a conspiracy brewing ever since the Indian Government began to introduce certain progressive measures to benefit the common man. In the name of democracy the same conspiring circles sought to negate the very function of democracy.... one cannot overlook that the Indira Gandhi administration has launched a campaign to combat communal strife and introduce more progressive reforms. The broad economic programme contains measures to raise agricultural production and improve the lives of the millions of landless peasants".

Avoidance of Truth

After listing the achievements since the declaration of the emer-

DEVELOPING COUNTRIES

gency, Dr. Atav quoted an instance to show how the Western press tends to overlook all these achievements but looks at everything from its own crooked angle. He said, "The UPI evaluation that Indian democracy has died just 28 years after Independence is a complete avoidance of certain other facts such as the anti-democratic character of the 26 paramilitary fascist-type organisations that were banned. We are hoping that India will emerge stronger and more democratic from the present situation."

Writing in the *Tehran Journal*, Iran, (September 1975), Yaseen Razavi said: "...The Western press had no right to indulge in mud-slinging and accusation mongering.... Occasions like this may arise in the history of any country and India was no exception".

Anti-people Attitude

Al Ahram of Cairo, Egypt (22 July 1975) commented: "The Parliament session comes in the midst of a huge campaign launched by those who shed crocodile tears over 'lost' democracy in India. It is, however, a campaign which cannot be regarded as characteristic of, or confined to India. It is in fact a malady which spreads all over the Third World countries, in their capacity as a glaring example of the malignant campaigns of distortion and delusion which those countries are subjected to in the course of their struggle against colonialism and reaction".

Al Sahafa (10 July 1975) of Sudan observed: "The allegation of the Western press is an ideological one and it does not conform to logic. This is because her (Mr. Gandhi's) unchallengeable sincerity towards her country and people has caught this point so that she could save her country and nation from involvement which the West is passing through".

The *Daily News* (11 July 1975) of Tanzania remarked: "Evidence is beginning to shape that the anti-people attitude of the West is the driving force behind the current barrage of abuses, denunciations and propaganda directed against Mrs. Gandhi, the Prime Minister of India. What has she done? The West says, she is imprisoning 'people' arbitrarily. The West says that she is 'killing' democracy.... Would the

"Several newspapers in the West have special standards for India, with regard to economic and social conditions and foreign policy. Our achievements are ignored but our shortcomings grossly exaggerated."

"Many of these foreign interests had criticised us when we were fighting for our freedom. They criticised us when we established our political system. They criticised us when we embarked on planning. They criticised our scientific advance. They would in fact criticise anything which strengthened India in any way".

—Prime Minister

United States have liked it if someone went on a worldwide campaign saying that by killing or imprisoning the Panthers, the US was killing Western democracy?.... The progressive forces of the World must not swallow the Western bait...."

El Chaab (June 1975) of Algeria expressed the view that "It is not quite by accident that the Western press should attach so much importance to the situation (in India). It is ironical that those very people who tried to justify the fascist dictatorship in Chile are now talking of defence of democracy."

The *Times Journal* of Manila, Philippines, (11 July 1975) asserted: "We cannot accept the aggressive view of the Western press that Mrs. Gandhi decided to rule by decree simply because she would like to maintain herself in power. No sane human being would like to be head of State for life, since to be head of State is to abandon privacy and therefore to feel the outrage of being imprisoned in spite of power. It is foolish to believe that the Western press has a ready solution for the teeming millions of India. Only India can solve her problems and only she can fashion her own destiny among nations."

Scandal-mongering

Even in the West some journalists have started realising the declining standards and the inherent dangers of such a decline. Speaking on the

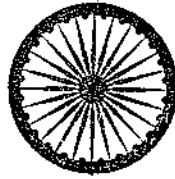
freedom of the press under the auspices of the Fleet Street district of the Institute of Journalists in London on November 5, Mr. William Rees-Mogg, Editor of *The Times*, severely criticised the authors of gossip columns in the *Daily Express* and the *Daily Mail* by name, and described the contents as scandal-mongering. He regretted that sometimes no consideration of public information or relevance was concerned and said that exploitation of private suffering for higher circulation was shameful. He added: "We are bringing it on ourselves; not only that but endangering the whole reputation of the Press".

Pseudo-events

Professor Daniel Boorstin the well known American Social Historian and Librarian of the Congress and this year's Reith Lecturer over the BBC is said to be the originator of a significant phrase, pseudo-events, which fill the pages of the Western press, especially in relation to the developing countries. Writing about him in *The Times* of London, (3 November, 1975), Philip Howard said that it was Prof. Boorstin who propounded the doctrine that we are shut off from the experience of real life by the constant intrusion pseudo-events. "By a new application of Gresham's Law, counterfeit happenings tend to drive spontaneous happenings out of circulation. We regress from news gathering to news making, from travellers to tourists, from shapes to shadows, from ideas to images."

No wonder the credentials of the correspondents of Western news for fair reporting are being increasingly questioned in Asian and African countries who no more have any illusions about their objectivity and fairness. If anyone is to blame it is the Western press itself. □

**DEMOCRACY
DEMANDS
DISCIPLINE**



nation on the move

"Time and again, India has given evidence of an indomitable spirit. In recent years, as in the past, she has shown unmistakable courage and capacity for meeting new challenges. There is a firm base of Indianness which will withstand any trial."

SMT. INDIRA GANDHI

**We have met many challenges since we became free.
And here is a record of our achievements :**

Food production has gone up from 4 crore 80 lakh tons in 1948-49 to over 10 crore 40 lakh tonnes in 1973-74. 

Number of villages electrified has increased from a mere 3000 before the beginning of the First Plan to over 1 lakh 62 thousand by January 1975. 

Number of pumpsets energised has risen from 21,000 to nearly 26 lakhs. 

Production of coal and coke increased from 2 crore 80 lakh tons in 1948-49 to 8 crore 12 lakh tonnes in 1973-74. 

Production of fertilisers increased from 18,000 tonnes in 1950-51 to 13 lakh 80 thousand tonnes in 1973-74. 

Cement from 1 lakh 62 thousand tons in 1948-49 to 1 crore 47 lakh tonnes in 1973-74. 

Output of refined petroleum products increased from 2 lakh tonnes in 1950-51 to nearly 2 crore tonnes in 1973-74. 

Power generated rose from 457 crore 50 lakh kwh in 1948-49 to 6,500 crore kwh in 1973-74. 

Area under irrigation has increased from 2 crore 8 lakh hectares in 1950-51 to 3 crore 15 lakh hectares in 1973-74. 

 Production of bicycles went up from 46,000 in 1948-49 to 25 lakhs 80 thousand in 1973-74.

 Electric fans from 2 lakhs in 1950-51 to 22 lakhs in 1973-74.

 Radio sets from 54,000 to over 17 lakhs 75 thousand in 1973-74.

 Sugar produced in 1973-74 was nearly 40 lakh tonnes as against 10 lakh tons in 1948-49.

 Cotton cloth from 44 crore yards to 795 crore metres in 1973-74.

 The number of Post offices increased from 36,000 in 1950-51 to 1 lakh 17 thousand in 1973-74; number of telephones from 1 lakh 68 thousand to 16 lakhs 37 thousand during the same period.

 Life expectancy has increased from 32 to 50 years. The death rate has come down from 27.4 per thousand to 16.9 between 1950-51 and 1973-74.

 Literacy rate has gone up from 16.1 per cent in 1950-51 to 29.5 per cent in 1973-74. Number of school-going children has gone up from 2 crore 35 lakhs to 7 crore 98 lakhs during the same period.

let us get on with the job of NATION BUILDING

SSP 75/230

Investment In Scrips

Preference Shares and Company Finance. By Dr L.C. Gupta, *Institute for Financial Management and Research, Madras, pages 115; Rs 30*

PROF. L.C. GUPTA'S BOOK is a timely publication drawing the attention of investors to the dangers in investing in preference shares. Publications on this topic are few. Dr. Gupta as such had to work under severe limitations. His work coverage includes the investment performance of preference shares in quoted companies only.

Preference shares are a novel invention—sugar coated pills supplied to risk averting people who are mad after safety of capital and stability of earnings. The author's purpose is to find out the extent of gap in between these apparent features of preference shares against the actual investment experience.

Prof. Gupta approached the problem with the keenest appetite without recourse to corporate jargon and resounding words. Taking the skipping of preference dividends as the first problem he points out that



this practice is very common and actually 1/3 of the selected companies give evidence to this fact. During periods of dividend suspension there is a marked fall in the prices of preference shares and in some cases it was found that they lost their investment character and became a 'speculative counter'. Saddled with heavy preference dividend arrears, companies are not paying anything in return and the legal protection in such cases is extremely weak. Investors are unaware of the fact that even when dividends are paid off afterwards they will have to face loss which is fully discussed in chapter 4. As such, preference share-

holder instead of endowed with benefits, gets the worst of everything. These conclusions are well supported by the evidence provided in the 39 tables.

The author's examination of the 1600 quoted companies in 71-72 brings out the distressing fact that preference shares occupy a prominent place in company finance. To find out the market structure of preference shares Prof. Gupta has selected 187 companies and amazingly the study reveals a high degree of concentration of ownership.

There is no novelty in Gupta's suggestions except in emphasis. Protection to investors by legal means is a remote possibility in India, (in this connection)—instead there should be a total ban on the issue of preference shares as is suggested by Prof. S.L.N. Simha in his 'Foreword'.

On the whole, the treatment of a controversial subject is very objective. The subject matter is dealt with in a lucid and direct manner. This is an important pioneering work and should be read and re-read with benefit by one and all. A word of appreciation should go to ICSSR for sponsoring the project.

V. Suryaprakash Rao

Focus on PAC

Parliamentary Control Over Finance, by S. Seshadri: *Allied Publishers, New Delhi; pages 295; Price Rs 45.*

THE FLY cover on the book introduces it as a work in depth of the growth and working of the Committee on public Accounts (PAC), that august Parliamentary institution which was set up to fill in the final and crucial stage in the cycle of financial control. The study which is intended as a comprehensive guide on the working of the PAC, is divided into some nine chapters including the last one on case studies which should more appropriately form part of the Annexures. The scope, functioning, methods of working, role and powers, status and position of officers concerned are some of the varied aspects discussed by the author even if the sequence and framework of analysis could have been improved with advantage.

The title of the book arouses our curiosity as to the strategy and specifics of democratic control over nation's finances. Questions that come freely to mind, for instance, relate to the extent of fulfilment of the tasks envisaged for the Committee

in relation to the efficacy of methods/procedures adopted by the Committee, the effective discharge of the many obligations, the comparability of the Indian Institution in its endeavour and results to other similar institutions functioning in democracies elsewhere etc. To seek answers to these and other related issues, the unwary reader is required to plod through some 200 and odd pages of the book meandering through different aspects of the functioning of the Committee including fairly uninspiring details such as sittings of the Committee, time and venue of the meetings, seating arrangements etc! With his intimate knowledge of the working of the Parliamentary institutions and association with the Lok Sabha, the author is able to draw upon a number of anecdotes, illustrative cases and notings to enliven the narrative. The accounts of working of the Committee, especially bearing on such delicate issues as what constitutes a policy, relationship with independent and semi-autonomous bodies and executives etc. are instances in point. The message however, is more easily and effectively drawn if the material

so painstakingly gathered, is edited and provided in an evaluative frame which sharply focusses the merits of various issues. We are warned that this is not a book on Committee systems spelling out the generalities. Even so the presentation unfortunately leaves the reader precisely with such an impression. To the researcher in Parliamentary institution, particularly, this book provides a wealth of data and case material. The reference index at the end useful as it is, reveals the efforts that have gone into the compilation of the study.

K.S.V. Sanjeeva Rao

BOOKS RECEIVED

Growth of Indian Economy in Socialism

*Edited by Ashok V. Bhuleshkar
Published by Oxford & IBS Publishing Co. Pages 640. Price Rs. 80.00.*

Population—Second India Studies.—by Jai Pal P. Ambannavar.

Published by S.G. Wasari for the Macmillan Company of India Ltd. Pages 122 Price Rs. 8.00.

Food—Second India Studies by V.M. Rao *Published by S.G. Wasari for the Macmillan Company of India Ltd. Pages 117. Price Rs 8.00.*

By unanimous verdict the people's representatives in Sikkim opted for full membership of the Indian Union making it the twenty-second constituent State of India. In answer to some readers' demands for acquaintance with the land and people of this new member of the great Indian community, our correspondent and photo officer spent over a week there, meeting people and visiting institutions and savouring the perennial beauty of its Himalayan landscape.

Here is their report in words and pictures.

SIKKIM, **The Orchid**



Photographs: P.K. KAPOOR

n The Bouquet

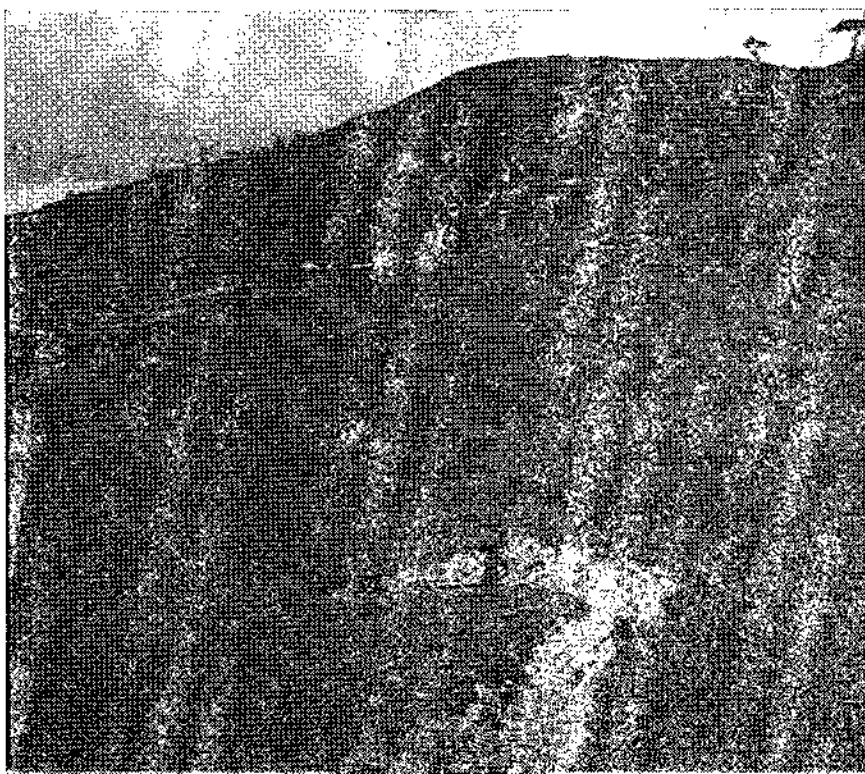


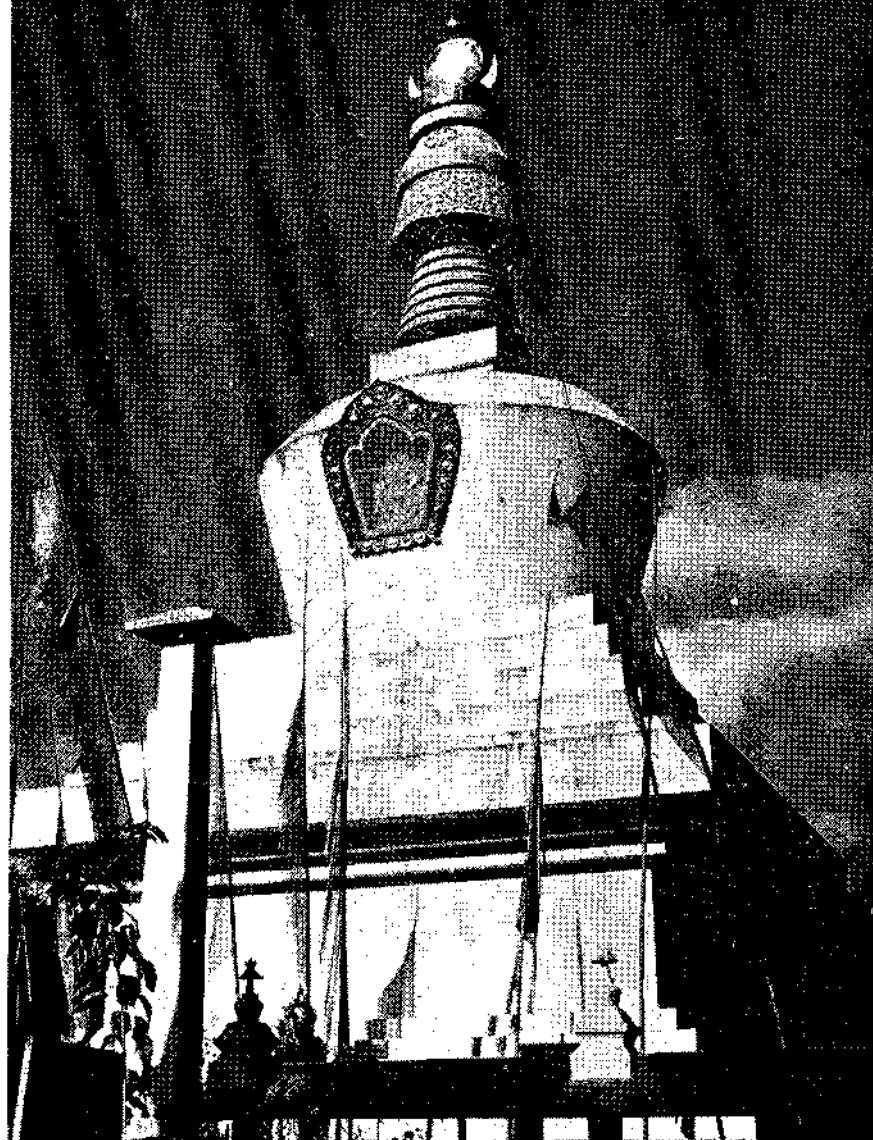
KHANGCHENDZONGA, the world's third highest mountain peak; vast stretches of Himalayan glaciers trodden only by the *Yeti* and the mountain bear; closely packed hills asprout with 4,000 different varieties of plants and shrubs and over 400 kinds of orchids; huge butterflies and diminutive dogs; a hard-working, warm-hearted and forward-looking people speaking as many as eight different languages with mellifluous ease; breath-takingly beautiful mountain streams that can bring in one single night the anger of the gods into the hearts of men; berries, fruits and roots that will not grow anywhere else on the earth; ancient hilltop monasteries with gigantic Buddha images and monks chanting away their lives to the cadence of gongs and pipes; and Kazi Lhendup Dörji-Khangsarpa of Chakhung, a man born of proud, aristocratic forebears serving the humblest of men as their foremost minister. This is Sikkim, the mountain State on a difficult frontier, the 22nd flower, an orchid, in an uproariously colourful bouquet that is India. (Continued overleaf)

SIDDHARTHAN KARIYAL

*reports on a mountain peoples' journey
from feudalism to democracy*

LEFT: A view of Gangtok, Sikkim's capital
BELOW: Fissures caused by earthquakes (Photo by Raghavan)





Above: A Chorten at Deorali. Below: Another view of Gangtok town. Opposite page top: The Sikkim countryside. Bottom: View of Khangchendzonga from Gangtok.



BETWEEN three and four in the morning, a single beam of sunlight touches the 28,208 feet high peak. The fiery star swiftly grows in size and soon the whole mountain range is ablaze, the shades varying from a deep orange to a most delicate pink. The vestments of vermillion are soon gone but there is lilac and, finally, pure white underneath...the surrender of the snow-clad peak to the orb of light that comes sneaking in the dead of night is one of the most seductive sights available to man anywhere on earth.

The people of Sikkim worship the Khangchendzonga, the House of the Five Treasures. It inspires one of Sikkim's blazingly splendid religious dances in which the mountain confers its blessings on the worshippers. It has been subdued by man only once, but the intrepid mountaineers did not tread upon the last few feet of virgin snow out of respect for the feelings of the people who pray before it. Spelt Kanchenjunga by the British, the Tibetan word also appears as Khangchen-dzod-nga in some official publications. But the spelling used in this report is the one favoured now by the Sikkim Government. But to the finicky phonetician transliterating from the Tibetan, there is the real tongue-twister, Khangchen-mDzod-INga. The five treasures designated by the name refers to the five summits of the gigantic mountain.

To see Khangchendzonga from Sikkim's capital, Gangtok (which means simply 'hilltop' in the accurately descriptive Sikkimese language), one has to journey north from Siliguri in West Bengal, accessible by road, rail and air. The eastern wing of the vast Gangetic plain sweeps northward in Bengal and comes to an abrupt end at the foothills of the Himalayas. The river Teesta enters the plains just north of Siliguri town and is immediately joined by two more rivers. More than half a mile wide at the point of entry to the plains, the Teesta is hardly wider than a city street just one kilometre up in the hills. The National Highway 31-A begins its mountain climb where the Teesta enters the plains and follows the river all the way up to the confluence of the Teesta and the Rongit on Sikkim's boundary with West Bengal. Here the road branches off in three directions, one to Darjeeling, one to Kalimpong and the third to Gangtok and beyond to India's northeastern frontiers.

Every inch kept scrupulously repaired and traffic-worthy every day of



the year by the Border Roads Development Board (BRDB), the NH 31-A is one of the most spectacular roads anywhere on high mountains. For half the journey up to Sikkim's borders, the river is to the right of the road, and then to the left. Its turbulence heightened by boulders the size of buffaloes but contained by steep banks flush with bamboo, banana, fern, and tall trees and

vegetation of a most fascinating variety, the Teesta holds the travellers' gaze for nearly five hours it takes one of Sikkim Nationalized Transport's smart, 25-seater mini buses to traverse the 116 kms distance from Siliguri to Gangtok. In winter, the Teesta is a playful stream, its bluish waters broken by countless sprays and cascades in white. In summer, when the rains and the

melted snows from the glaciers come down, it rises a metre or more, and the thunderous roar of smashing boulders in the swift rushing waters sends up a fearful symphony from the deep gorges.

It is a wild river untamed by man. People still talk of the disaster it brought in 1968 in a flash flood. An entire bazar at Teesta crossing and a graceful ferroconcrete bridge named





Coronation Bridge were washed away. The Bali brothers, the Punjabi proprietors of the Denzong Hotel at Gangtok which was our headquarters during our week-long stay, were one of the victims. Their capital invested in some riverside civil works contract disappeared with the flood. Still reeling from the shock, they are hard put to it to keep the hotel in a respectable state of repair, once declared 'inbound' to all ranks of the Indian Army, and a hangout for Dev Anand and his troupe when he made 'Jewel Thief' in Sikkim.

Landslides, slope failures, toe erosion and even earthquakes are common features in the Himalayan region. The geologist's story is that the Indian subcontinent was once adrift in the ocean. In its journey northward and collision with the Asian mainland, there arose the Tibetan plateau, the Himalayan

ranges and its foothills. But the titanic forces which created the world's greatest mountain ranges are by no means at their close. The land still moves at the rate of about one inch a year, and the geologist cannot predict how many mountain-forming aeons it will take more for it to come to a settlement. In the meantime, man, courageous man, makes his home, his villages and towns, his roads and bridges, in a wild maze of hills still unready to receive him with hospitality. And the Teesta valley is one of the most inhospitable. C. Karunakaran, Director-General of the Geological Survey of India, recently described the valley as 'a veritable field museum of slides in its diverse manifestations'.

Sikkim might well be one of man's newest settlements anywhere. The people of Bhutan in the South-East dreaded this country and called it 'Druk', the Land of Thunderbolts. The Lepchas, the scattered original inhabitants (even today they are only 13 per cent of total population of 250,000, fifteen per cent being Bhutias, 70 per cent being Nepalese and two per cent being people from the plains), called themselves Rong-Pa, the People of the Ravines, and their land, Nemayal Ranzong Lang, a Country Inhabited by Honest People, a name indicative of the people's simplicity in their own eyes. The very name Lepcha (derived from Lapcho), means a Gathering Place, presumably, of a people who had wandered in search of a place to settle down. The presence of rice, an early grass cultivated by man for the sake of its grain, and the place's Tibetan name, Denzong (country of rice), associating it with that crop, might well give the historian another clue to Sikkim's exact antiquity. But the name Sikkim itself is of recent origin: A Lepcha king of historic times is said to have married a princess from the Limbu tribe and she is supposed to have called her new home 'Su-Him', the New Place. It then metamorphosed into Su-Khim and then to Sikkim.

A branch of the Teesta originates somewhere at Lachen, the Great Plain, north-east to the Zemu glacier on the slopes of the Khangchendzonga. In Sikkimese mythology the Teesta is a maiden guided by a serpent and the Rongit is her lover, guided by a bird. They meet at Pesok (from Posok, literally, the meeting place). On arrival at the tryst, the maiden discovers her lover

already at hand, and in discomfiture calls herself 'Teesta', the Embarrassed One.

But the philologist would aver that the Teesta gets its name also from 'Tashita', a word meaning 'The Rock of Auspiciousness'. And the auspicious thing about the Teesta is its potential to generate power, if not to defile the beautiful mountains with industries, at least to light

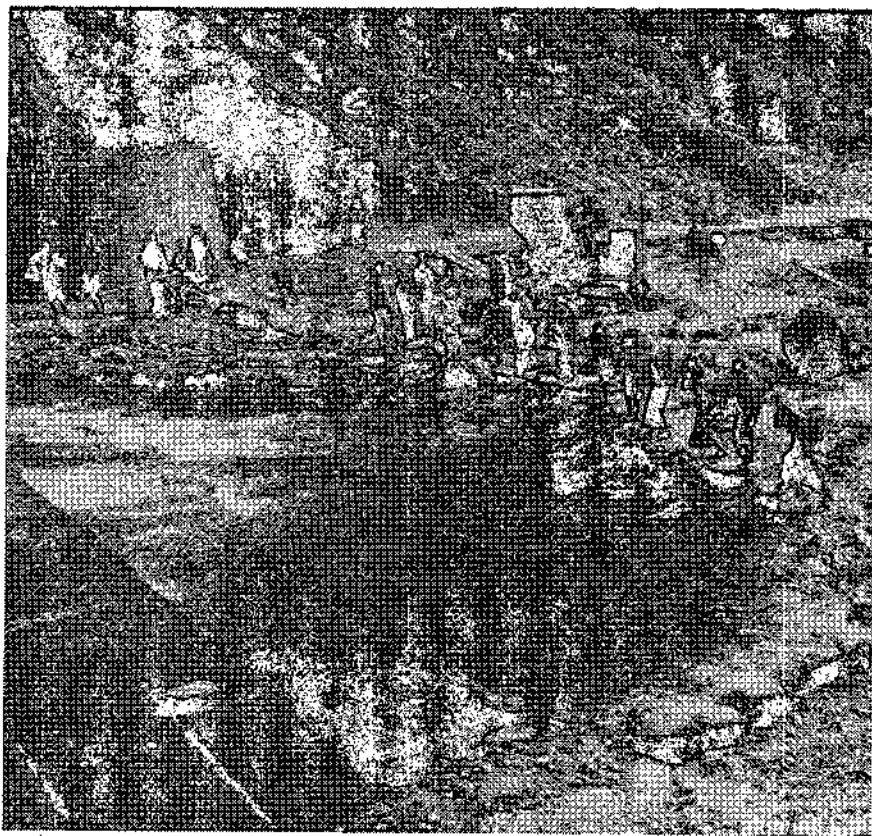
Opposite page top and bottom: Scenes at the weekly Lall Bazar. Right: Phrubu Namgyal, the master weaver in charge of the carpet section of the Government Institute of Cottage Industry at Gangtok. Below: Vanda Coerulea, one of Sikkim's 400 orchids. Bottom: A Bhutia woman and her dog at Lall Bazar.



people's homes, to keep them warm in the harsh winter, to give them employment during construction, and to keep them going from sale proceeds of electricity to the hungry factories down in the plains of Bihar and Bengal. According to one estimate Sikkim's rivers dropping from 19,000 feet and above in the glaciers to about 1,500 ft before they emerge on to the plains in less than 100 miles (from north to south Sikkim measures only 70 miles), are capable of generating 1,000 megawatts of electric power. Keeping this enormous potential in view, hydrological investigations have already been started in the catchment areas of the Teesta.



* See "Proceedings of the Seminar on Landslides and Toe Erosion Problems With Special Reference to the Himalayan Region", organised by the Indian Society of Engineering Geology, Gangtok, February 24-26, 1975



But it has a long way to go. A talk with A.M. Krishna, Superintending Engineer of the Central Water and Power Commission in charge of the Lower Lagyap Project now halfway through to completion on the outskirts of Gangtok town on

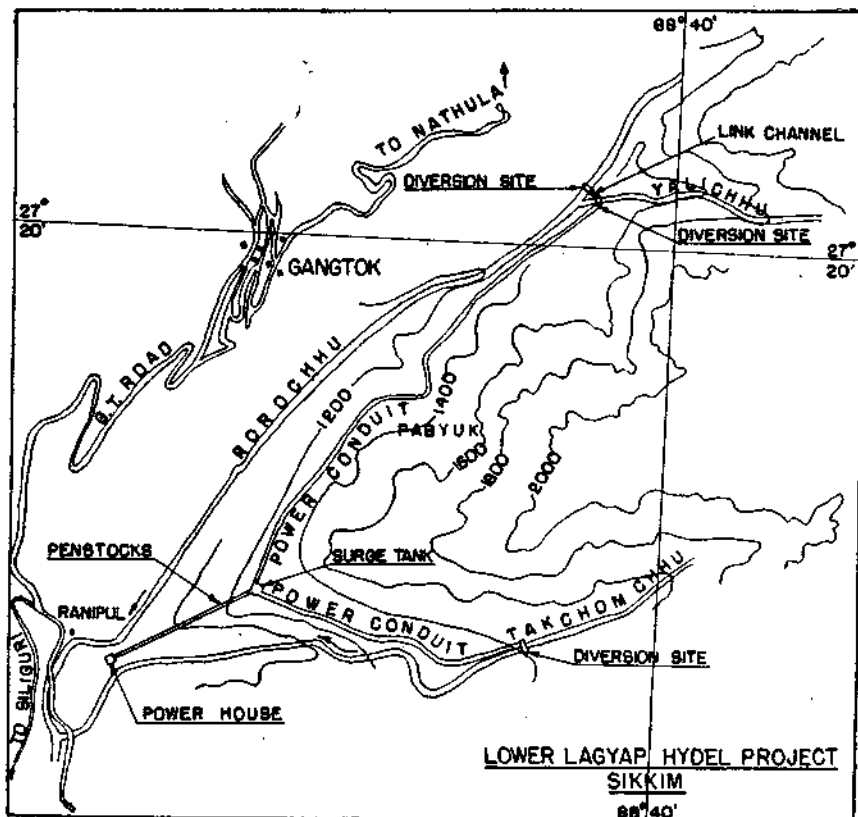
three of Sikkim's minor rivers, the Rorochu, the Yalichu and the Takchomchu, gave me an insight into the intricacies and difficulties of building major projects in the region. The Lower Lagyap Project estimated to cost Rs 60 million earlier is now

going to cost Rs 145 million, more than double, and has been criticised and even held up on this very count. The generated power, too, is going to cost 55 paise a unit, considered uneconomic elsewhere. But as engineer Krishna pointed out, a major share of the cost of generation is on account of annual clearance and maintenance costs, on a high scale. The building costs themselves go up because work cannot be undertaken throughout the year: Unlike three shifts in other areas, the Lower Lagyap is able to chalk up only one shift a day, and that too only for six months in the year when the weather permits it. There are difficulties when it comes to materials too. Mica strains in the local granite make it brittle and building norms have to be established on the basis of careful tests. The project has set up its own testing facilities for the purpose. Locally available river sand too has to be cleansed of clay. The Lower Lagyap is mainly a pipe project; the water is brought from a high level to the turbines at a lower level by means of penstocks and conduits; using steel sheets of five mm to 30mm thickness.

The sheets have to be transported from the plains through mountain roads, and the many hairpin curves do not permit large sections to be carted easily. Even machinery brought by contractors are lying idle on riverbanks because the frail bridges won't take those heavy loads. They now await partial dismantling and the strengthening of the bridges.

The project, depending on the combined catchments of the Rorochu, the Yalichu and the Takchomchu, comprises a weir on the Rorochu for the diversion of its waters to the Yalichu through a link tunnel. The combined waters of the Rorochu and the Yalichu are carried through a power conduit taking off from the Yalichu diversion site, to the surge shaft located on the top spur near the village Pabyuk. The waters of the Takchomchu are also carried to the surge shaft, by a diversion weir, through a power conduit. The penstock taking off from the surge shaft terminates at the power house located on the bank of the Takchomchu.

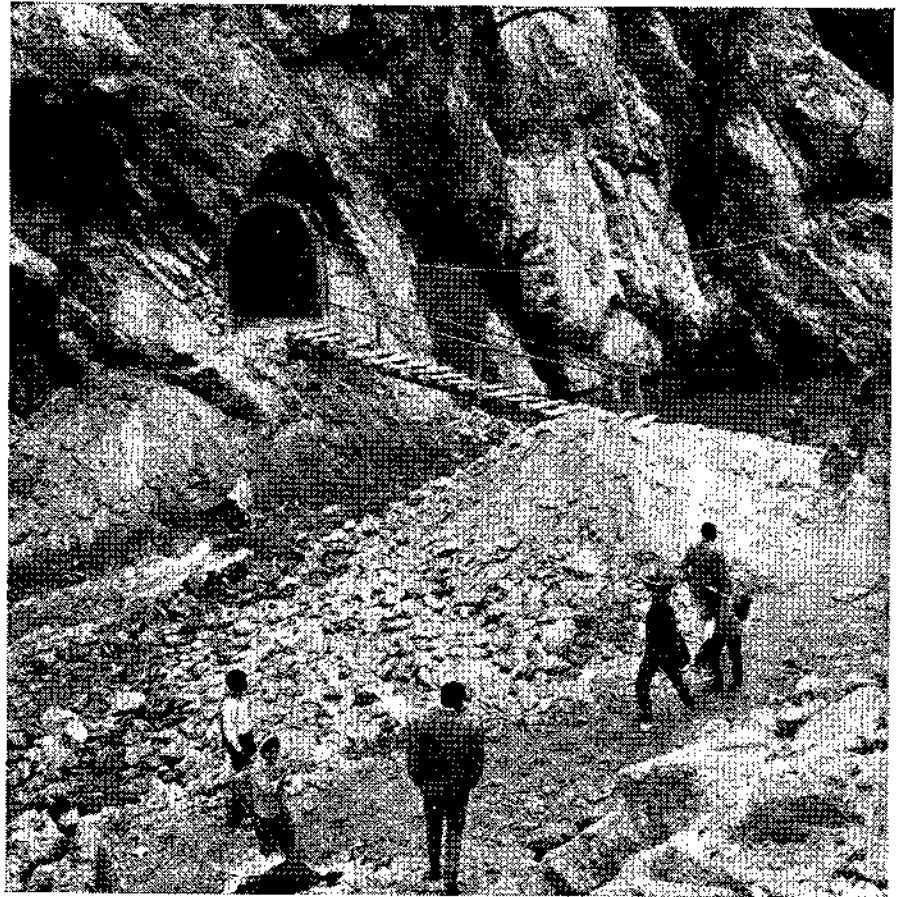
The Rorochu trench weir is nearly completed. The weir across the Takchomchu is three-fourths complete. The weir across the Yalichu has been taken up. About half a kilometre of the total length of tunnels running to some 1.4 km is complete. The first-stage excavation of the conductor system too is



complete to nearly 11 kms. Other works already finished are excavation for the surge shaft and trace cut for penstock lines, excavation for the powerhouse at foundation level and the erection of fabrication machinery. The engineers have blasted the hills to provide them with a wide enough ledge to locate the powerhouse and the switchyard. Rs 52.5 million have already been spent on the project. When completed in 1978, the Lower Lagyap will provide a firm output of 6,000 kw and can afford a seasonal generation of an equal magnitude for about seven months. The powerhouse will have an installed capacity of two units of 6,000 kw each initially with provision for installing the third unit in the future. At present, Sikkim gets its power from a 2,100 kw power station at Jali.

Half the power generated at Lower Lagyap will be reserved for a paper mill to be set up at Melli to produce high-grade industrial paper including extra-strong Kraft paper, other high-strength packaging papers and abrasive paper. The paper mill, to be set up on the State's southern borders for fear of polluting the mountain streams, will make use of Sikkim's main raw material, coniferous timber. Advance action has already been taken to cut 100,000 cubic feet of logs and bring them down to the site of the paper mill. The last ten miles of the 40-mile transportation will be by river, said to be the first operation of its kind in the eastern region. To meet its capacity of 25 tonnes of paper a day, the mill would consume 1,000,000 cubic feet of timber a year!

Of Sikkim's total land area of 2,818 square miles, nearly 1,050 square miles are covered with forests. In the sub-tropical zone up to 5,000 feet high, one finds several varieties of bamboo, ferns and tree ferns, pandanus, orchids, and valuable hardwood like sal. Typical of the sub-tropical zone are dense undergrowth and bush vegetation. Cherry, laurel, oak, chestnut, maple, juniper, fir, pine and magnolia grow in the temperate zone from 5,000 feet to 13,000 feet. Beyond that up to 17,000 feet are alpine pastures. Rhododendrons, some 35 species out of India's total of 44, grow wild and abundant from an altitude of 8,000 feet and above. The gentler slopes on the higher ranges sport carpets of gentian and primula in spring. With 40 per cent of the forests considered as protected belts, the wilds provide a sanctuary to the Himalayan bear, the brown bear, barking deer, sambar, snow leopard, yak, panda, the marbled cat, leo-



An access tunnel under construction at Lower Lagyap. Opposite page: Work in progress on a trench type weir across the Takchomchu.

pard, otter, musk deer, squirrel, tiger, blue sheep, civet cat, Tibetan gazelle and the Kiang (wild ass). Imports of trout from Kashmir in 1944 had stocked the Yumthang. There is now a plain to stock other streams also with this fish as well as the mahseer.

Sikkim indeed is a paradise for the plant geographer and the botanist. Tibetan monks practising the *Amji* system of medicine had discovered this long ago and the Dalai Lama's doctors used to collect their herbs from North Sikkim. Dr Burman's well-known house of Ayurvedic medicine at Calcutta (Dabur) buys sizeable quantities of rare medicinal plants from Sikkim every year. To place the cultivation of these herbs on a sounder footing, tests are now under way at drug research stations at Poona and Lucknow, to determine the alkaloid content of dozens of leaves and roots used in the *Amji* system of medicine. Since all man's medicines are either derived from or inspired by plants, this rich, vast and only partially tapped reservoir promises immense resources to the drugs and pharmaceuticals industry in the country.

In Sikkim, there is a way of making even protected forests commercial propositions, points out the State's

Chief Conservator of Forests, C.K. Pradhan. Cardamom needs shade and the precious spice can be grown underneath trees without disturbing them. The Government has already set apart about 2,500 acres of forests to be distributed under long-term leases to poor cardamom cultivators at the rate of two-and-a-half acres per person. The 1,000 families will get saplings, knowhow, fencing materials and fertilizers; half the help as subsidy and the other half as loan repayable in four years. This programme to help the weaker sections of Sikkimese society is expected to yield the State a turnover of Rs 5 million after four years. Some 1,400 acres of forests have already been distributed under this programme and the rest will be distributed by April next year, so that plantings can go on from June or July. Sikkim produces about 2,000 tonnes of cardamom (the large variety) every year and it gives the State about Rs 30 million in revenue. When the small cultivators take up their forest holdings and start producing, the yield is expected to go up by 50 per cent even. As of now, it is natural selection and the ingenuity of the cultivators themselves which are sustaining cardamom in Sikkim.

Some varieties are known to be virus resistant. There is no uniformity in grading the produce now. Sikkim very badly needs a far-flung purchasing organisation under State auspices which would eliminate the crooks in the trade with their nefarious practices. At present, cardamom sells at Rs 10 a kilogram at Gangtok, compared with Rs 20 at Delhi, but the price a buyer offers to farmers in the districts is not more than Rs 5 to Rs 7 or so. The Forest Department now plans to popularise this condiment abroad in special, hand-made packaging. They are also trying to get manufacturers to devise drying chambers of a design similar to those used in tea estates.

Sikkim grows very little tea (an estate is now started) but great quantities of delicious oranges. The fabulous variety of orchids is yet another exotic forest wealth promising Sikkim hard cash. For the first time in the subcontinent, a cut flower industry on a large scale based on orchids is to be promoted in Sikkim. It has passed the experimental stage and large-scale cultivation is under way. This unusual export is expected to enrich the Sikkimese to the tune of Rs 4 million a year in foreign exchange. Conscious of its possibilities, the Sikkim Government had imposed a ban on the removal of any orchid plant from within the boundaries of the State as far back as 1950. Commercial trials undertaken by the Forest Department's trained personnel have indicated that at least six species are good for the cut flower industry. The Forest Department has also plans to landscape with orchids the whole of Gangtok town.

The Pastures

The pastures rich in medicinal herbs involving some 10,000 acres are not included in the State's reserve forest belts and there is a plan to develop fodder in these areas for yak and sheep. In the sparsely populated northern areas there are, according to some reports, only four to five families with over 500 yak. Sheep too are scarce. The flocks are migrated down the slopes in search of grass which recedes with the advancing snowline. While the State's animal population may not add much to national aggregates, it is everything to people who depend upon it for their livelihood. And dwindling sheep population has brought things to such a pass that the Government has to import wool from other areas to keep going Sikkim's looms for carpets and blankets, essential items in a cold region.

Fodder development is important for the Army too. Their needs in Sikkim are placed at Rs 5 million worth of hay alone, and half the outlay is transport costs. Fodder research stations at Jhansi and elsewhere, therefore, have been assigned with the task of prescribing strains suitable for the high altitudes. Sonam Paljor, 29, trained in agricultural and veterinary sciences at Allahabad and at Canterbury University in New Zealand, the Assistant Director of Feed and Fodder Development in Sikkim, however, uses his own resources and contacts to try and get results. His trials with oats, Pennisetum, Napier, Paspellum, para grass and jowar on a 52 acre farm at Tadong are quite successful, although the results are not as expected with a couple of varieties of clover. About 60 quintals of concentrate is sold by the farm every month. They also try to propagate different varieties of fodder grass.

Precariously Perched Agriculture

But Paljor's main concern is, as with every other development worker struggling against Sikkim's almost vertical topography, erosion. The rice terraces of Sikkim are indeed majestic monuments to man's ceaseless struggle to make himself viable on his own terms in a hostile setting. At the corners of the crescent shaped terraces on the bellies of hills, the ledges are just two feet wide and nowhere are they more than 15 feet across. Every inch of these ledges must get the attention of human fingers for water to stay and rice to grow. Drought animals cannot

even climb those stairs, let alone work them. This intensive cultivation, however, aggravates the casualties in land use. The topsoil gets carried away in an incessant drain and often, when the farmer neglects to strengthen the bottom-most ledge, the entire hillside farm tumbles down in a mass of rock and rubble to the valley below. Conscious of the need to coordinate the efforts of all agencies to save the land from serious erosion, the Seminar cited earlier had proposed the creation of a Teesta Valley Development Authority on the lines of the DVA. A land-use board with the Chief Minister as Chairman is seized of the problem now.

The cheaper, easier and better way to convert vegetation into something on the citizen's plate in Sikkim, Paljor feels, would be animal husbandry. Except for a small section, the Sikkimese are all hearty meat eaters, relishing beef, mutton, pork, fish and fowl in soups, stews and curries. While the conversion of grass or grain into edible protein is elaborately expensive elsewhere, it ought to be cheaper and easier in Sikkim's lush hills where the rains give root and leaf to everything that falls on the ground.

The shift from grain to grass, from plant husbandry to animal husbandry, however, is not easy. Sikkim's farmers live on their lands as only homesteaders in thickly populated Kerala do, not in villages but in scattered houses on stilts built right in the midst of arable slopes. In fact, in the whole of Sikkim there are said to be just two villages in

A beneficiary with his birds at India's first ever poultry estate, run as an employment programme, at Tadong near Gangtok.





Amina and Mohammed Ibrahim with some of their children, supposed to have inspired the Hindi film, 'Ishk, Ishk, Ishk', at their hotel on Gangtok's mainstreet.

the sense they are known in the plains, clusters of houses. Tilling this land with handtools is a way of life with the people, the land wrested from the hills is too precious to be reverted to animal grazing. In this circumstance, agriculture has to stay, backbreaking and non-amenable to mechanization of any kind though it may be, and animal husbandry remains the handmaiden of agriculture.

Sikkim's Director of Animal Husbandry, Dr R. C. Khera, however, refuses to be discouraged. Given the backing of the former Chief Executive (now Governor) B.B. Lal and the late Planning Minister D.P. Dhar, at the time of Sikkim's accession to the Indian Union and urged to produce dramatic results at the grassroots level, Khera proceeded to achieve the miraculous with what might be called chickenfeed. With a lifetime of experience behind him in the scientific aspects of poultry, its management, marketing and all else that goes with it, Khera marshalled men and materials to set up a

poultry estate, India's first, at Tadong, five km from Gangtok. To make the venture a success, he had to import sawdust for the litters, feed, building materials and the chicks themselves initially.

Dham Bahadur Rai, 29, one of the beneficiaries under this employment programme, got six months' intensive training and about 500 birds from the Department. He gets feed for the birds at subsidised rates from the Government which buys the eggs from him and sell them to the Army and other consumers.

Khera now has a franchise going in association with a well-known international poultry firm to breed and sell hybrid birds of fine quality. Today, just a few months after the first bag of sawdust came by truck from Siliguri, his birds can be seen even on country roads. A well-known firm of feed manufacturers has allowed Khera, a large buyer, a special rebate over and above the normal trade concession. The Animal Husbandry Department has also opened a small milk collection

centre with modern equipment.

Precariously clinging to steep hills under a spell from the Khangchendzonga, its tin roofs painted an impossible blue and its walls a shade of cherry-blossom-pink, Gangtok is as different as could be from anything in the plains. But the visitor is advised to come before the onset of the hard monsoon in late May when the leeches get ferocious, or before the setting of the severe cold spell beginning January. The Nor Khill run by the Tourist Corporation of India is a comfortable place with running hot and cold baths and electrical heating. There are also inexpensive places in the main bazar of the town for the rubberneck on a shoestring budget willing to subsist on *momu*, soup and tea.

Momu is served best by Mrs Amina Ibrahim at her husband's establishment on mainstreet, the Green Hotel and Restaurant. It is mince meat made up into pakoras served eight at a time with a bowl of hot soup. Said to be Tibetan in origin, *momu* is plain when steamed and



special when fried; nourishing, filling and cheap either way.'

But the far more special thing, I soon discovered, is Mrs Amila (the 'N' becomes 'L' in Tibetan) Ibrahim herself, serving the dish. Typical of Sikkim's hardworking women of any racial origin, Mrs Ibrahim carries almost the entire burden of running the hotel on her *baku*-draped shoulders. Up at five every morning, she spends the next two hours going over every stick of furniture in the place, even the jar-encrusted tops of tall cupboard getting the thorough attention of her duster. Hers is the lone Muslim family in the whole of Sikkim and was, not long ago, in the whole of Tibet. Amina's husband Muhammed Ibrahim, 55, arrived at Gangtok in 1919 as a two-year old boy with his father, Mohammed Sabila, a trader on the wool-and-opium route from Ladakh. Sabila's opium won him friends and they

persuaded him to stay on. The king gave him land to construct Sikkim's only mosque and a place to live on mainstreet itself. In 1940 Sabila went to Lhasa and found Amina, Ibrahim's bride. The couple now have seven daughters and two sons. The handsome family is said to have inspired a Hindi film even, 'Ishk, Ishk, Ishk'.

But Mrs Ibrahim is by no means unique when it comes to working shoulder to shoulder with men. Durgi Lama, an unassuming housewife otherwise, is a famous revolutionary known all over Sikkim. In Gangtok, I found even bars run by women, and nobody tried to be funny within the precincts. At the weekly market too, more than half the stalls were held by women from far-off places. And the friendly dogs they kept with them, it appeared, were more for company than for protection. Those dogs, incidentally, took up much of our energy

and time at Gangtok: Sizing up every street cur with a covetous eye, I tried to get one by fair means, but the Army and men of the CRP and the BRDB had jacked up the price far beyond the means of my threadbare purse: Rs 800 for a decent pair of Apsos or Tibetan Spaniels; Rs 200 for those without much pride of ancestry.

At present, the Army is able to procure only 25 per cent of its daily consumption needs from within Sikkim. In another five years, however, the State's own contribution to the Army's needs is expected to go up to 60 per cent. The Border Roads Development Board contributes nearly Rs 40 million directly toward Sikkim's economy by way of labour charges and contracts. The strategic value of its painstaking work is incalculable. Roads and bridges get nearly one-third of Sikkim's own budgetary outlays and this priority will continue for many more years to help open up the mountain-locked State to development. In adjoining Nepal, people say, the ruling Ranas had deliberately refused to build roads as a negative strategy to keep the British out, who would have come for shikar if there had been roads, and would have found other reasons to overstay the hospitality. In Sikkim it was the thin spread of population which made roads a luxury. People found ancient muletracks serving their purpose and they are still serviceable. But development projects like the Dikchu mines and the Sikkim Mining Corporation not to speak of health, education and others on the social services sector, make roads and bridges imperative items on the infrastructure list. Under its rural development programme, the Government of Sikkim has drawn up a plan costing Rs 1.5 million a year for village roads, market feeder roads and bridges. Various major and minor bridges will cost an additional Rs 6.4 million. There is also the prestigious Rashypa prestressed concrete bridge costing Rs 8 million, expected to be completed this year. A master plan for the next 15 years is under preparation.

Mineral Resources

Sikkim's mineral resources include copper (0.3 million tonnes of proved reserves of copper and zinc ores at Dikchu), coal, graphite, gypsum, iron, silver and, possibly, gold. The Sikkim Mining Corporation, a joint venture of the Government of India and the Government of Sikkim, now running the Rangpo mines, is preparing a detailed project report on the Dikchu prospect in Sikkim.



Above; Young girls under training at the Government Institute of Cottage Industry. Right; Rosiela Barphungp, the sales-in-charge at the Institute shows off a colourful Tanka. Opposite page: The new 'Tashiling', Government secretariat, under construction. The archway is painted in bright colours.

Other industries now in operation are Sikkim Jewels (for cutting and polishing imported industrial gems), a fruit preservation factory at Singtam, a distillery with 51 per cent Government equity participation at Rongphu (of the Rs 4.7 million excise revenue last financial year, as much as Rs 4.5 million was from the distillery labelling alcohol variously as 'Shangrila', 'Black Cat', 'Juniper Gin, and, yes, Sikkim Eau de Cologne) and, a transistor radio assembly unit in the private sector at Gangtok. Examples of neglected sectors now getting attention include leather, handicrafts, khadi.

Goodbye, Feudalism

Although Sikkim had abolished landlordism as far back as 1949, the patronage of the ruling family had continued to be paramount. While the people have now abolished the institution of the Chogyal (a Sikkimese name for Maharaja), tenant-landlord relationships based on a concept of private estate

and durbar still continues. The big problem now before the Government of Sikkim is to conduct a land survey and bring to an agreed settlement records of rights and disputes. In the meantime, the Governor had promulgated two ordinances, the Sikkim Cultivators (Protection) Ordinance of 3 July 1975 and the Sikkim Prevention of Transfer and Unauthorised Use of Lands Ordinance of 13 August 1975. These are now sought to be replaced by bills brought before the assembly in September last. One peculiarity of Sikkimese land relations which calls for caution is its ethnic undertone, a ticklish matter with social and political overtones.

The difference between a popular government setting democratic priorities and a feudal family power setting autocratic priorities are seen best in Gangtok town itself, a capital city with a King's palace (not to speak of extensive real estate belonging to the King), but with no municipality. Scavenging and a

dubious water supply system were provided by the Bazar Department, but the housewife had no place to dump the garbage. Nor were there property tax or building bye-laws. The buildings rising tier upon tier may present a brave front, but the dirt behind them is a dank horror. The filth simply accumulates and turns back to nitrogen with the active help of bacteria. Now, a bill has been passed by the Sikkim Assembly to provide Gangtok with a proper municipality. Nine members have already been nominated to the council. A sewerage system costing Rs 6.4 million is to be implemented shortly. The Government of India will bear the whole of this cost. Gangtok will also be acquiring a more trustworthy water supply system on the completion of the Rateychu project.

Health and hygiene, Colonel Y.R. Dani in charge of it told me, is very much part of the people's demand for a better deal. Their journey from feudalism to freedom can be mean-

Sikkimese Way to a Sound Constitution

Mr. G.S.K. Pillai, 29, and Mrs Sinamith Lepcha Pillai, 25, (right) make a handsome couple. The young technical officer in the publicity department of the Government of Sikkim hails from Kerala and landed up in Gangtok via Singapore and Hyderabad following his brother who is also married to a Lepcha girl and settled in Sikkim. My curiosity over typical Sikkimese home cooking getting the better of me, I had oiled my way to their home for *Thupa*, egg noodles served with a meat soup flavoured with ginger and garlic. Boiled mince meat and pork came with a sauce made up of coriander leaves, green chillies, tomato and green onions. The Sikkimese palate, it struck me, was rather bland, a happy *via media* between the hot spiciness of Indian dishes and the pickles and fermented sauces of Chinese cooking. His wife's cooking with its wholesome emphasis on a variety of meats, Pillai admitted, had done wonders for his constitution. He returns the favour with Idli and Dosa whenever possible.



Earlier, I had heard a journalist friend tell of a prominent Sikkimese personage of how he downs as many as eight eggs and about half a kilogramme of various meats for breakfast alone, which lasts him till dinnertime, another memorable meat landmark. But, to Kapoor's constant astonishment, we found no "fat ladies" in Gangtok: The steep streets and stairways took care of the fat, and

kept the ladies in swette trim and the gentlemen in supple energy.

But the surprise at Pillai's home that evening was *Thumba*, a drink I sipped through a bamboo pipe out of a large bamboo quiver. *Thumba* is made out of the millet *Khodo* (*bajra*). It is thoroughly washed, parboiled and spread out to cool. When still slightly warm it receives yeast pounded up with rice at the rate of 25 grammes per five kilogrammes of *Khodo*. It is then wrapped in a clean cloth and kept in a warm, draughtless place, preferably in a wooden cupboard. After 24 hours in summer or 48 hours in winter, the fermented *Thumba* is transferred into airtight earthen pots or jars where it matures in about 20 days.

The dry *Thumba* is filled into tall bamboo jars and topped with warm water, whereupon a mysterious alchemy takes place and a mildly alcoholic beverage is produced. The gracious thing for the guest to do is to sip through the bamboo pipe till a gurgling whistle is heard, on which the host tops the barrel again with warm water. In civilized company one *Thumba* barrel will last a man more than an hour, the kettle making its appearance only at fifteen minute intervals. The exhausted millet left in the barrel is fed to pigs.

ingful (indeed, the resounding cry during the agitation for democratic rights was 'There can be a country without a king, but there cannot be a king without a country'), only if life is made cleaner and less hazardous. The hazards, Dr Dani enumerated, were intestinal disorders, pulmonary tuberculosis, anaemia, goitre, worm infections, and skin and fungus infections. A survey on sexually transmitted diseases is yet to be carried out. Sikkim's health facilities were in a state of neglect and the problems were aggravated by lack of trained personnel, the nature of the terrain, living habits of the people, their demographic distribution, and Sikkim's weather and climate. While two health workers (male and female) per 2,000 population and more district hospitals are planned now, Col. Dani's strategy is to convert available staff into self-contained units capable of functioning independently in farflung areas. An in-depth study to improve the services both quantitatively and qualitatively over a ten-year perspective is under way. A new 300-bed hospital at Gangtok and four district hospitals with 50 beds each are to come in 1976.

All centrally sponsored health programmes will be extended to Sikkim. As malaria is not much of a problem in the State, the staff

sanctioned for it will be converted into multipurpose health workers. While Gangtok's hygiene and sanitation will continue to be the responsibility of the Bazar Department, the Medical Directorate will supply them with technical guidance. As there is no separate public health engineering, the work will be handled by the PWD itself. A novel approach Col. Dani has mooted is to try and get large project authorities to set apart funds for the creation of permanent facilities like buildings, so that the medical personnel could get a take-off pad. Overall, with only 22 doctors for the whole of Sikkim and half-a-dozen vehicles of '61 vintage, the hard-pressed Colonel, I found, had every reason to be peppery. (The half-hour spent staring at half-burned human thigh-bones and pieces of Tantric brassware in the Museum of Tibetology at Deorali had cost me an appointment with him, the Colonel relenting and granting me another date only at my abject salaaming).

The lack of adequate numbers of trained personnel has to be seen in Sikkim's overall perspective. With just 250,000 people distributed over 2,818 square miles and that too in sparse pockets, the people of Sikkim are actually better off with their per capita annual income of about Rs 1,000 than their counterparts in

many other parts of India. But poverty exists. In Sikkim's situation, the crucial things are channels for irrigation, village roads, small suspension log bridges and other small projects to wipe off the backlog of rural development. Already, some 21 projects to irrigate some 5,000 acres are under way. People gladly give their land for these projects and their willing help and manpower too to complete them fast. When Panchayats come into being from 1976 (in another month the final electoral roll will be ready), there will be more of people's participation in development administration.

But manpower for specialised tasks will continue to be a big problem for many years to come. If rural health, road building, animal husbandry, agriculture, and a host of other programmes are really to be translated from paper to people, there must be more midwives, nurses, overseers, veterinary scientists, etc., etc. There is just one college in the whole of Sikkim, and that too an evening affair for office goers, with no proper affiliation with any university. The North Bengal University at Jalpaiguri, mercifully, has now agreed to take 11 students this year as external examinees. The school pyramid is shown in Table I. The total school-going population is just under 21,000, compared with 13,000 in 1968. The State now plans to spend in its Fifth Plan Rs 13.8 million for primary school education, Rs 12 million for middle school education and Rs 16.5 million for higher secondary education (provisional figures). Ear-

TABLE I: THE SCHOOL PYRAMID IN SIKKIM

Level	Boys	Girls	Total
Class I to IV	11,056	5,771	16,827
Class V to VII	2,156	1,174	3,330
Class VIII to XI	552	250	802

lier, Sikkim's 67 monasteries had played a big role in education, as well as Scottish and Roman Catholic missions.

Sikkim's Chief Minister, Kazi Lhendup Dorji-Khangsarpa of Chak-hung is himself a product of monastic education. Scion of the most prominent of Sikkim's ten Kazi families, he entered the Rumtek monastery in 1912 at the age of six where he became a desciple of Tshurfuk Lama Rabden Dorji. Later, the Maharaja Sikyong Namgyal placed the young monk Lhendup in a Tibetan school in Gangtok. At the age of 16, Kazi Lhendup returned to Rumtek. On finishing his training in lamaship, he became the head lama of this important monastery and its estates.

The Khangsarpa family has always been associated with all that is forward-looking in Sikkim. It was Chief Minister Dorji's great grandfather who had first brought in workers from Nepal to cultivate the hills. The Kazi's grandfather, too, had played a memorable role in shaping Sikkim's destiny. For fifteen years, he was Sikkim's ruler, having despatched the Maharaja to exile and Darjeeling, where the

deposed Chogyal was born.

In 1945 Kazi Lhendup Dorji-Khangsarpa started the Sikkim Praja Mandal and was elected as its first President. In 1953 he became the President of the Sikkim State Congress and held that post till 1958. An aristocrat turned democrat, his long struggle for democratic rights for the people of Sikkim against a self-seeking feudal power came to a head in 1972 when the Chogyal removed him from office as an Executive Councillor, to which he had been appointed earlier in 1970 with charges over agriculture, animal husbandry and transport. On his return from Europe the Kazi fought the 1973 general election and the fresh election held in April 1974. He became the Chief Minister of Sikkim on 4 April 1974. The Kazi speaks Sikkimese, Tibetan, Lepcha, Bhutanese, Hindi, Nepali, English and Limbu.

The Kazi's years in the wilderness were made comfortable for him by his Belgian-born wife, Elisa-Maria. A charming personality in her own right, Elisa-Maria comes from the land-owning Junkers stock of German ancestry. Chou-En-lai, a close friend

during the Sorbonne days in Paris, congratulated her upon the wedding for marrying 'the most honest man in Sikkim'.

A journalist in Europe for 16 years made memorable by interviews with Hitler, Mussolini and Ataturk, the Kazini had had fat cheques (Rs 200,000 in one case) waved under her nose by London Sunday papers for her memoirs of intrigue, revolution and attempted murder in the high Himalayas, of escaping from poison in milk, and dynamite under bridges (97 sticks in one instance, discovered in the nick of time because a small boy had happened to play with the colourful wire left by the careless, would-be assassins), and sundry other escapades.

I listened enthralled as she told me of that night when her servant, Passong Lepcha, (with the family for the past 16 years since the age of six), dragged her by the hair out of a room planted with explosives. On another occasion, she got her maid, her Tibetan spaniel Will Wu, her radio, and half-a-dozen voices produced from her own throat to create a most unholy din in their house at Kalimpong to scare away gun-toting men in the garden. A Roman Catholic by faith, Elisa-Maria had also taught school at Delhi's St Columba's.

Never tired of emphasising Sikkim's tourist potential, Kazini Elisa-Maria of Chakhung is in some danger of becoming one of Sikkim's prominent tourist attractions herself. Recently, on publication of her profile in a Bombay journal, she had had some Parsi perambulators making it all the way to Mintokgang to have a 'dekho' at her. But she calls such people 'occupational hazards' and gives them a hearty welcome.

The Kazini's only complaint now is against villagers insisting on treating their bedroom as an informal Panchayat. When the Kazi turns taciturn, she calls him her Favourite Mongolian. But when Kapoor wanted the Kazi to change from his informal robes into a more colourful silken Baku, she declined to put up the brash suggestion and swore that the Mongolian was master in his own house and that the lone Junker could go thus far and no further, a reference to the historic Junker domination of Mongolia. The Kazi, however, has enough good humour to put up with brash photographers, as well as with a better half who had once asked a king designating half-divinity to himself, "Which half, your highness?" □

The Kazi and Kazini with their Dog Willi Wu





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Development Notes

L & T Produces Hydraulic Excavators

The first high pressure hydraulic excavator to be manufactured in India has successfully undergone proving tests and trials and is ready for delivery. Manufactured at the Bangalore Works of Larsen & Toubro Limited (L & T), the first machine has been ordered by the National Mineral Development Corporation Limited for loading iron ore fines at its Kiriburu project in Orissa. The bucket capacity of this crawler mounted machine is 900 litres. The machine operates at a hydraulic system pressure of 4300 psi.

Representing the latest advancement in excavator technology, the hydraulic excavator is conceived as a basic tool for earthmoving. It is a potential and mobile power pack with inherent handling abilities enabling it to be used in excavation, power and irrigation projects, in building construction, agriculture, industry, public utilities, mining, ports, steel mills, road and railway construction, flood control and relief and defence.

L&T Poclain hydraulic excavators will be manufactured in two versions—crawler mounted and wheel mounted. The first machine has 48 per cent indigenous content, mainly comprising the engine, undercarriage and some fabricated components. In three years, both the wheel and crawler versions will have 90 per cent indigenous content. L&T's production programme envisages the manufacture of 30 machines by April 1976. There will be phased increase in production till the licensed capacity of 150 machines is reached.

Poclain hydraulic excavators are already in operation at many projects in India. Over 15 machines are already on order, the customers including Bharat Coking Coal Limited, the Maharashtra Government, construction contractors and mining enterprises. L&T has fully geared itself to provide the customers the necessary replacement parts and servicing facilities from strategic centres all over India.

Collaboration in Building Fishing Boats

An agreement has been signed between Governments of India and Norway for cooperation for the development of a programme for building fishing boats.

The boat building programme is for the period 1975 to 1979. Under the agreement Norway will give this country a grant totalling over Rs 55 million for the construction of eight fishing vessels at Goa Shipyards, Goa and Rajbagan Dockyard, Calcutta. Two of these vessels will be used for fisheries training programmes and will be attached one each to the Central Institute of Fisheries Operatives, Cochin and the Central Institute of Fisheries Education, Bombay. The remaining six boats will be used for exploring fisheries resources along the Indian Coast.

Norway will also supply the spare parts for the construction of these vessels. Technical knowhow in the form of detailed and shop floor designs of the vessels and construction methodology will also be provided. It is expected that eventually Indian shipyards would be capable of constructing larger fishing vessels on their own.

Norway has helped India in the past too in the field of fisheries. Under the Indo-Norwegian Project which lasted from 1952 to 1972, India developed her mechanised fishing boats and fish processing methods. Ever since 1972 Norway has continued to assist India by providing equipment and expertise on fisheries development.

Registration of Government Companies

According to the provisional figures available, there has been a spurt in registration of new Government companies in the first year of the fifth Plan (1974-75) as compared to the previous year especially in Backward States. Sixty-two Government Companies came into being during the year against 64 in 1973-74. The authorised capital of the new companies was slightly more about Rs 512 crore against Rs 512 crore in 1973-74. The increase

in the number of companies indicates diversification of public investment into more sectors.

In eastern region in Meghalaya seven Government companies were formed with Rs 27 crores, while in the previous year only one company was registered with an authorised capital of Rs 50 lakh. In Tripura in the same region the figures of registration moved from one to two with authorised capital going up 2.5 times.

In western region, Rajasthan got a special fillip with 11 Government companies being formed up with Rs 22 crore as authorised capital. No new company was registered in the State during the previous two years.

Jammu & Kashmir which was also in a similar position with respect to the two earlier years had one concern registered with Rs 5 crore authorised capital.

Other States where both the number of companies and the amount of the capital showed substantial upward trend include Delhi, Bihar, Gujarat, Madhya Pradesh and Kerala.

Tamil Nadu was the only State which had the distinction of having attracted greater attention both from Govern-

ment and private agencies. The numbers of companies and also the amount of authorised capital was higher on both the accounts.

Of the 92 Government companies registered 49 companies moved into the processing and manufacturing against 33 previous year. Speaking of the aggregate, the distribution of companies reveals that more than a half, by number, and over 75 per cent by authorised capital of the total companies registered during 1974-75, were engaged in the broad industrial group of processing and manufacture, comprising foodstuffs, textiles, leather, metals, chemicals etc.

The group Commerce (Trade and Finance) came second in importance among the newly registered companies.

Increase in Coal Production

Productivity in coal industry has shown a distinct improvement during the current year and this upward trend will be kept up. The power situation in the country is very comfortable, with the power availability around 221.21 million units a day as against the estimated demand of 225 million units a day.

Coal production has registered a sharp increase of 10 million tonnes last year and another ten million tonnes more would be achieved this year. As against the production of 78 million tonnes during 1973-74, the production at the end of 1975-76 would be 98 million tonnes, which would represent an increase of 25

per cent. This has been achieved without any appreciable increase in manpower.

The Coal India Ltd. has planned to open up some new mines in West Bengal. The possible locations being considered are Jhanjhra, Nakarakunda and Puroshattampur in Ranigum coalfields, besides Begunia and Jogred.

An open cast mine is being developed in Uttar Pradesh block of Singrauli coalfields with the targetted coal production capacity of two million tonnes by the end of 1978-79 and with possibility of expansion to 4.5 million tonnes later. The total investment plan for the project would be Rs 21 crore.

Central Assistance for Irrigation Projects

An additional plan assistance of Rs 10.40 crore has been approved by the Central Government for irrigation projects in Andhra Pradesh, Kerala and Maharashtra. This brings the total additional advance plan assistance for irrigation projects in the current year to nearly Rs 57 crore. The extra assistance is intended to accelerate the execution of various projects as part of the programme to create an irrigation potential

of five million hectares under the 20-point Economic Programme.

The release of the special assistance of Rs 10.40 crore is subject to the condition that the State Governments will take positive decision in the current financial year for revision of water rates. They have also been advised to draw up suitable works programmes for each project to achieve the physical targets.

CFTRI Develops Vital Chemical

Lindane, an important chemical used in the manufacture of a large number of pesticides will now be produced in India, thanks to the research done at Central Food Technological Research Institute, Mysore. The country's entire requirement of this product has so far been met by imports.

The process developed by CFTRI involves production of Lindane from indigenously available Benzene Hexachloride (BHC). Lindane is effective against various types of pests and its application is

comparatively safe. It can be used in household and also on agricultural crops.

The raw material BHC constitutes about 70% of the total production of pesticides in the country and is widely used on foodcrops, stored commodities and in public health programmes. But its extensive use poses problems as it is known to accumulate in human or animal tissues and also pollute the environment. The new technology developed, does not accumulate in human issue.

YOJANA

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Letters

Dear Sir,

I must be thankful to you for the publication of the article 'The Haphazard Growth of our Cities' based on a speech delivered by our Prime Minister Mrs Indira Gandhi, at the Sixteenth meeting of the Central Council of Local Self Government on October 23, 1975 at New Delhi (*Yojana*, Vol. XIX No. 20 dated 15 November 1975).

Emphasising the great influx of rural population towards the urban centres, Mrs Gandhi highlighted upon some other reasons too and desired a united effort to face the problem. Likewise, I would like to write a few lines in the context.

When India is categorised as developing country, it is natural that many geo-economical, cultural and social imbalances will be caused

during the process of development. To remove these imbalances and maintain human-space relationship, it is necessary to chalk out regional plans so that the problem may become easy of solution. Without digressing from the planning process, it is the task of the city to prepare a balanced plan for all-round development. The towns hold a key position in the general fabric of the economy and social life of a region.

If, not only the cities but their surrounding areas are developed simultaneously and urban amenities are provided for the rural population, this influx may be checked and towns may be saved from haphazard growth.

M.L. Soni
 D.N. Degree College
 Fatehgarh

Dear Sir,

We are receiving your esteemed magazine 'YOJANA' in our library regularly since the last ten years. The magazine is an excellent one and it is very useful for the readers seeking information on economic and social aspect of our country.

Considering its utility and worth, I think that this magazine must have author-title-subject index after every ten years. This will help the readers to locate their subject in the different issues of the magazine very quickly. May I know if such an index has been published by your office. If not, is there any plan to take up this project?

Promila Chopra
 Baring Union Christian
 College, Bataal

Quotation Box

I want to bring into existence a country which won't be the laughingstock of the world any more.

If I were a head of State in Europe, I would behave differently.

—President Mobutu Sese Seko of Zaire

Prostitution should never be legalized because this would open Israel to moral standards this country has avoided.

—Rabbi Shmuel Nathan President: Yeshurun Central Synagogue in Jerusalem

The position of a language in the world reflects the political and economic power of the country of origin. After World War II it was clearly English—or rather American.

—Michel Bruguere, Director,

High Committee for the Defense and Expansion of French Language

I received perhaps excessive praise at one stage—I may receive excessive criticism now.

—Henry Kissinger

Oil takes a curious grip on people's imaginations. However great the wealth that it brings, the public always over

estimates it and usually by very large margins.

—Editorial in

The Washington Post

I believe there is enough for all, it only we have the desire to share.

—Indira Gandhi

Very little has changed since the 1880s when the chaprassie—the wearer of a chapras or glittering brass badge-plate—was described as the refractory medium through which the people of India saw their rulers.

—Editorial in *The Statesman*

The Big Take-over... Arabs are buying up London.

—Headline in *Evening Standard*, London
 Slipping back into London life, I found to my surprised pleasure recently, is as easy as doing so in Calcutta. In the principal language of both cities I am perfectly at ease.

—Chanchal Sarkar in *The Indian Express*

The whole slant of our censorship is wrong. There is so much fear of even a mildly erotic scene that the depiction of violence is permitted by way of compensation.

—G.D. Khosla in *The Statesman*

It would be useless to think that Pakistan will ever be ready to hand over their part (so called Azad Kashmir area held by Pakistan).

—Sheikh Abdullah.

People always say, 'Dali loves publicity'. I answer, 'Yes, that's true, but publicity loves Dali even more'.

—Salvador Dali.

There is no time to lose. We must maintain, and indeed improve, the tempo of growth.

—Jaggiwan Ram

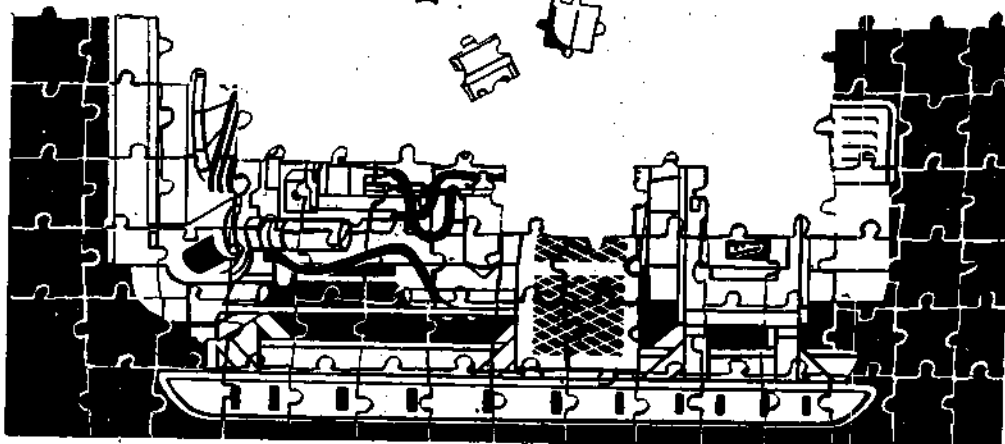
Only those who accept Africans as their 'bwana kubwa' (big boss) and would serve under them are welcomed in the country. Those who cannot, should pack up and go.

—President Kenyatta on the 12th anniversary of Kenya's independence.

The change from description to evaluation is one of the most potent agents for decaying meanings. A word starts life, like a new tool, with a sharp descriptive edge. Humans, in their propensity to exaggeration and carelessness, use words that are meant to be descriptive chisels as evaluative screwdrivers. And before you know where you are, you are left with a box full of blunt tools and a hazy vocabulary.

—Phillips Howard in *The Times*, London

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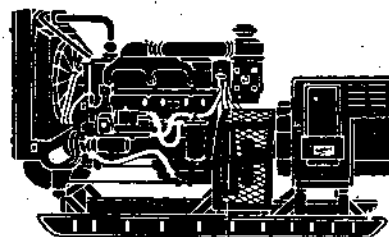
In 1972 the Government granted licences, (worth millions of rupees) for generating sets imports.

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