

Yajama

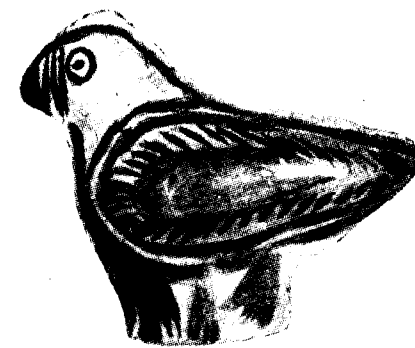
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YOJANA



BIG DEEDS HUMBLE MEN

In this feature
Yojana seeks to present
the outstanding achieve-
ments of some of the
many millions of obscure
men and women who
are working to build
tomorrow's India.

FROM A VENDOR TO A FARMER

A native of Velliangiri, A.K. Ramaraj losing his father at an early age, moved to his sister's house in Tiruchy for shelter. He worked his way hard to ultimately own a piece of land for himself. Starting as an old brass vessel vendor he scrupulously saved a part of his income. His labour and prudence enabled him to open a cycle shop. To it he added a loudspeaker set for supplementing his income. During his spare time, he undertook petromax repairing. His wife and five sons also helped him and worked with him. Later, he took to the sale of fertilisers at Athani. Nevertheless his savings drive continued as also the efforts to improve his lot. Now 53 year old Ramaraj not only represents a fertiliser agency at Kallipatty but also owns over 8 acres of land at Chinnakulathur Thottam, in Coimbatore District. The first tubewell he bored did not yield water, but undeterred he bored another which has enough water to irrigate his land which was formerly partly gravel, clay-mixed and coloured.

Now he is a prosperous farmer cultivating paddy, sugarcane and bananas on his land making full use of fertilisers and pesticides.

THE ENGINEER WHO RETURNED TO THE FIELD

K.V.R. Krishnaswamy is a farmer who educated himself for an engi-

neering career. After graduating from an engineering college, he instead of wasting time in seeking a job decided to take up farming in his home town Govindanagaram in Madurai district.

With a loan of Rs 75,000 he installed three motors at one of the wells and constructed a semi-gravity semi-pressure tank. Cement pipes of 9-inch diameter with a length of 2 1/2 miles were laid for irrigation. He fully utilised the expert agricultural advice, soil testing facilities and selected strains of seeds. Working hard on his 100-acre farm he succeeded in growing a large variety of crops like paddy, cotton, groundnut, maize etc. The IR-8 paddy yield he obtained last year was 75 bags, of cotton 20 quintals, and maize 25 quintals per acre. Krishnaswamy is confident of recovering within five years the entire cost of pipelines for irrigation from his income. The would have been engineer turned farmer now earns more than Rs 1 lakh from his farm, as compared with his annual income of Rs 15,000 before he laid the pipes for irrigation.

OPERATIONS WITHOUT SCAR

The Award winning Lady Doctor, P. Shanmugavadivu, is a pioneer in the field of trans-vaginal tubectomy (TVT) which is catching on in Tamil Nadu. She is a member of the Central Family Planning Corps and is presently posted at Salem.

During her short period of service in family planning she has done about 3,700 IUCDs and 3,060 tubectomies, including 60 trans-vaginal tubectomies at the Government Headquarters Hospital, Salem.

Dr Shanmugavadivu says, "when I joined the family planning clinic attached to this hospital, there was not much work in the clinic. But persistent and vigorous campaigning among the outpatients broke down their resistance and dispelled imaginary fears in respect of family planning practices. The method adopted was first to gain acceptance for temporary measure like IUCD and condom and then by constant follow-up to attract them for permanent service."

She says, "I have found it more rewarding not to keep anyone waiting for long, and never to allow complicated cases to go out of hospital unless completely

cured. In the context of anti-family planning propaganda by interested parties, my main aim is to ensure that we do not give a handle for criticism from the point of view of service efficiency."

The latest method—TVT, according to Dr Shanmugavadivu, has found favour with more and more ladies. Its popularity has justified a special 20-bed family planning ward in the Headquarters Hospital at Salem. "Since the stay in Hospital after TVT operation is short, I expect more popularity for it. Apart from being less complicated, the TVT has the additional advantage of leaving the abdomen free from operation scar," concludes Dr Shanmugavadivu.

SELF-HELP BRINGS WATER TO THEIR HOMES

Most people in the hilly tracts in Almora district of U.P., as also elsewhere in similar regions of the country, have to walk long distances to get drinking water in their earthen pitchers. This sort of manual water-lift has been a characteristic of the Indian countryside. The villagers in different parts of Almora have been, like their predecessors for generations, walking three to four hundred feet downhill to fetch water from the river Ganges. When the rains came or the winter gripped the areas in below freezing point chill, the hardship became much worse. At other times the agriculture languished for want of water.

But not any more. For the villagers of Manela, Routella, Manela Tewari, Manela Kama and Manela Tilora decided to end their misery by joining hands to help themselves. Under the initiative of the village elderman, Bishan Singh Bist, they raised Rs 3,000, got a loan of Rs 16,000 from the State Planning department and volunteered labour worth Rs 15,000 to install 12,000 feet of pipelines for carrying water down the hills to their villages. Three supply points were located between 1500 to 8,000 feet. Also, they constructed 10 tanks for water storage. As a result, 110 houses in Manela Gramsabha alone now have piped drinking water, the surplus from which is utilised for minor irrigation during the Rabi season and also for watering vegetable beds and fruit bearing trees.

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LEST WE FORGET

The prosperity of a nation depends on its capacity for production and on a rational distribution of wealth. In order to ensure the latter, we must get rid of all the present bottlenecks.

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Note: We have been giving the Index of selected articles published during the year in the last issue of the year. Due to printing difficulties and other unavoidable reasons we could not carry the Index for 1970 in our issue dated January 10, 1971. The Index is now being given in this issue. The inconvenience caused to our readers is regretted. —CHIEF EDITOR



A JOB, ANY JOB

THE worst calamity that can afflict a nation's life is unemployment. It is a disease of the mind and the body for a healthy people. And, it is a prolonged disease, for no short-cut remedies are possible. In India, the problem of unemployment acquires an added dimension. The country's population spiralling up in spite of vigorous family planning drive pushes upward the unemployment curve year after year. Thus, at the end of each Five Year Plan, as many people remain jobless as get jobs. With this acuteness, what is essentially a socio-economic problem becomes a major political issue with all its serious implications. Leading sometimes to violence and even to chaos in public life, the problem darkens the horizon and spells doom for the healthy functioning of democratic institutions. Since the bulk of job-seekers will always be from among the youth, unemployment generates commotion and foments crisis in the campuses of the nation.

Planned development in a developing economy must always search for a mechanism that would integrate the creation of job opportunity with economic development. This should be so not only to make the process of planning meaningful, but also to achieve the very objectives of growth. In its search for such self-propelling mechanism, the Planning Commission has tried over the last two decades different strategies with shifting emphasis. The Second Five Year Plan, especially, aimed at larger employment through more specific encouragement of village and small-scale industries so that a more diversified and dispersed strata of production could supply a large share of consumer goods in public demand. In the Third Five Year Plan, a rural works programme "specifically oriented towards relief of unemployment" was envisaged. The Fourth Plan, aiming at a rate of growth "significantly above the rate of growth of population", emphasises rural development and small-scale industry.

But, in retrospect, the Second Plan succeeded only partially, due mainly to the absence of "a common production plan" or a "continuous technical transformation of traditional industries", while the Third Plan limped through its life without creating "any definitive impact", being "too small and diffused". Also missing was a link with local development planning.

Consequently, when the problem of unemployment

assumed demonic proportions, especially after the recession of the mid-sixties, it became necessary to impugn the efficacy of the approaches and methods adopted to tackle this crucial issue. A Committee of Experts on Unemployment Estimates was set up in August 1968, which submitted its report in March last year. A significant finding of the Committee was that inadequate estimates of employment and unemployment subjected the plan formulation to an "unknown margin of error". With the Third Census round the corner, an excellent opportunity awaits the planners and economic evaluators to revise and update statistical data in respect of employment and unemployment. However, as a sequel to the Committee's report, the Planning Commission is causing a programme of studies that could form the basis of employment-oriented formulation of the Fifth Plan. And happily, these are to be undertaken with the joint participation of official and unofficial agencies.

Computing estimates of labour force available during a plan period is central to an accurate comprehension of the pattern of employment and unemployment and in formulating employment-oriented schemes with greater precision. Moreover, in view of the heterogeneous character of the problem—with great intra-regional and intra-district disparities in the context and content of unemployment, no schedule of development, unless based on accurate statistics, can respond to the specific needs of the people on a district or regional level. A correct estimate of job opportunities and job seekers will also put the several Fourth Plan programmes, like rural works programme, Small Farmers' Agency, etc., on an even keel, providing them with the necessary keys to coordination and integration.

While the ultimate objective of planning is to synchronise the nation's development potential with its population growth, the immediate objective should be fuller employment for the existing and available labour force. Must we have to choose between "more employment today, less tomorrow" and "less employment today, more tomorrow", it is better to choose the former, if only to keep the idle millions engaged rather than disenchanting and disillusioned. In the peculiar circumstance of our socio-economic transition, as typified by frequent outbursts of violence and disorder, the crying need appears to be a job, any job.

Editorial

EMPLOYMENT ORIENTATION IN PLAN FORMULATION

D. R. GADGIL

THE Planning Commission has been presenting estimates of the backlog of unemployment at the beginning of each Plan, the estimated increase in the labour force and the additional employment that might be created during the Plan period. However, there was considerable doubt regarding the appropriateness of the definitions and measures used. Besides, there were widely different magnitudes of unemployment worked out on the basis of data from different sources. Therefore, in August 1968 the Planning Commission set up a Committee of experts to inquire into the estimates of unemployment worked out in the earlier Plans and the data and methodology used in arriving at them and to advise the Planning Commission on the various connected issues. The Committee, which submitted its Report in March 1970, felt that the data available were not adequate and the conclusions based on them were, therefore, unavoidably subject to unknown margin of error. The Committee observed that the estimates of labour force, additional employment generated and the level of unemployment at the beginning or at the end of a Plan period, presented in one dimensional magnitude, were neither meaningful nor useful as indicators of the economic situation. It recommended that studies should be undertaken to get information on different segments of the labour force to identify the demand likely to be generated for particular categories of labour and suggested that an attempt should be made to obtain separate estimates of the levels of unemployment during different seasons of a year among various homogeneous groups of labour force. The Committee also suggested various improvements in the collection and presentation of data collected by various agen-

Edited version of a speech delivered at the First General Meeting of Economists in New Delhi in February.

cies. In view of this, an attempt was made in the Fourth Plan to present data on employment on the lines followed in the previous Plans.

The programme of studies indicated by the Committee on unemployment cannot be carried out by official agencies alone and it is important to secure the cooperation of non-official experts and academic and research institutions. The main objective of the Planning Commission in attempting to obtain a clear understanding of the unemployment situation is to be able to use this knowledge in shaping the approach to the formulation of the Plan so as to secure a better employment orientation in it.

There have been few instances in the past of an employment-oriented view specifically affecting plan formulation or leading to inclusion of particular plan proposals. The most important instance of this was that when the Second Five Year Plan was being formulated it was proposed that bulk of the increased production of consumer goods should be provided by the village and small-scale industries. The need to avoid technological unemployment and the importance of utilising capital and human resources already invested in these directions were emphasised and a policy of specific encouragement of small industries was advocated on this basis. However, a common production plan, a programme for the continuous technical transformation of traditional industry and an overall coordinated policy embracing all sectors were evolved only in relation to the cotton textile industry. It may be claimed that in relation to this industry the programme achieves a fair measure of success. There was considerable advance, both in techniques and adaptation of production, in the handloom sector and there was gradual advance of the small-scale textile industry from the handloom to the powerloom. The share of the traditional and small-scale industry

in total production increased as a result of the programme. In respect of other traditional and village industries, no attempt was made to evolve either a common production plan or a programme of continuous improvement of techniques and transformation of production.

Rural Works

The rural works programme of the Third Five Year Plan may be said to have been specifically oriented towards relief of unemployment. However, the programme turned out to be too small and diffused to make any definitive impact. As it was not formulated in relation to specific situations and was not integrated with local development planning, it did not leave behind much experience on which later programmes could be based.

It may be useful at this stage to indicate briefly the implications of the approach to this problem incorporated in the Fourth Five Year Plan. The main assumption was that securing a minimum rate of growth of the economy on a self-sustaining basis was a pre-requisite for the formulation of programmes for dealing effectively with any specific aspects of unemployment. This meant that the first priority had to be given to resuming the process of growth and development of the economy and for ensuring its continuance at a given rate significantly above the rate of growth of population. Therefore, though the strategy of the Fourth Plan, with its emphasis on rural development and small-scale industry, was based on the integration of economic development with opportunities of creating employment, the Plan did not contain any massive proposals for a frontal attack on the problem of unemployment *per se*.

It was also considered that the problem was not homogeneous and that the diversity of conditions in the field was very large. There was not only basic difference in the nature of the problem as between the rural and urban areas but also wide variations in conditions as between district and district. Therefore, it was thought better to take up, in the first

instance, pilot projects as related to specific situations rather than to embark upon generalised solutions on a large scale.

A number of pilot projects have been included in the Fourth Five Year Plan. These are directed, in the main, to the improvement of economic conditions of the weaker sections of the society. In the process the programmes have also to tackle the problems of under-employment and unemployment. The Small Farmers' Development Agency is concerned with providing a broader base of production to small farmers and making their operations viable. The marginal farmers' and landless labourers' schemes have the objective of increasing the production base of these classes but they have to be mainly oriented to increasing employment opportunities. It is expected that some of these schemes will lay emphasis on providing full employment to local landless labour and thus yield useful experience in relation to alternative methods of giving fuller employment to them.

Perhaps the most significant projects from the employment point of view are those of rural works in drought-prone areas. Presumably, the drought-prone areas are among those that suffer most from rural under-employment and unemployment. These schemes represent an attempt to integrate the provision of employment to unemployed or under employed labour with programmes of development of local resources for securing a broader and surer base to the economy of the area. It is expected that in course of time the programmes will be fully integrated with district development planning. Though the finance for the schemes in the drought-prone areas comes from a non-plan source, the organisation of work under them and its total direction and supervision are integrated with those of the other plan schemes. Schemes in urban areas are related mainly to apprenticeship and training and to provision of credit and other facilities for self-employment. Government have also decided recently to launch a series of specific employment schemes spread over all districts of the country.

It will thus be seen that though there is no single large programme dealing in a massive way with the problem of unemployment as such,

a large number of pilot projects directed towards specific situations have been launched in all States during the Fourth Five Year Plan. It is expected that these schemes will yield important results on the basis of which larger and bolder programmes could be effectively undertaken during the next Plan period.

It is often said and generally agreed that our Plans should be employment-oriented. However, much greater attention needs to be given to the definition of "employment orientation" and to the concretisation of this concept. Employment orientation could presumably, be related to the Plan as a whole or to its various aspects. It would directly affect the size of the Plan if, for example, employment orientation in a particular direction led to an increase in the totality of resources available for implementing the Plan. To the extent that employment orientation affected the strategy of the Plan it would influence its structure, the sectoral allocations and allocations as between different programmes. Employment orientation could influence the types and levels of technology adopted and could lead to a change in the spatial distribution of economic activity. It could also indicate important alterations in the fiscal, financial and economic regulatory policies of Government. It might thus affect the entire strategy and the basic structure of Plans or influence to a greater or lesser degree important aspects or details.

In the context of developing planning, the relief aspect of the unemployment situation would not be considered important. The main emphasis would be on utilisation of redundant labour for capital formation or for further activating the economy. Obviously the orientation, whether as a comprehensive package or as individual proposals, would be examined in relation to its propriety or efficacy as compared with possible alternatives in the short and the long run.

This field is still largely unexplored. At the same time the situation in the country urgently demands not only that intensive work should be undertaken on the subject but also that its results are so formulated that the possibilities and limitations of action in relation to planning effort are brought out clearly.

PLAN ALLOCATION FOR RURAL INDUSTRIES DOUBLED

ON the recommendation made recently by the Rural Industries Planning Committee, the Planning Commission has doubled the Fourth Plan outlay for Rural Industries Projects Programme from Rs 4.5 crore to Rs 9 crore.

Another recommendation of the Committee seeks to extend the existing 49 projects to all the districts, excluding towns having more than 15,000 population. At present each project area covers 3 to 5 community development blocks. The Committee has also recommended that all the districts in the country should be covered by the Rural Industries Programme in about 25 years. Each successive plan should take up 50 new districts for which finances should be made available by the Centre for 5 years. At the expiry of each plan, these projects would be handed over to the State Governments for continuing them and new ones started from Central funds. The preliminary work regarding field survey, formulation of schemes and training of staff, is to be completed in the remaining years of the current Plan.

The Rural Industries Projects Programme was initiated in 1962-63 under a Centrally sponsored scheme to create more employment opportunities in selected rural areas through intensive development of small-scale industries. The Programme, which at present covers nearly 24,000 villages in 237 community development blocks, has been instrumental in creating 1,15,000 new job opportunities in about 29,000 new and existing small-scale units during the last six years.

Six more projects, one each in Haryana, Maharashtra, Uttar Pradesh, Mysore, Gujarat and Andhra Pradesh are to be started soon. These will work in coordination with the Pilot Cooperative Rural Electricity Projects which are already in operation there. The idea is to take advantage of the electric power being made available to rural areas by the electric cooperatives for intensive development of small-scale industries. Steps are also being taken to extend the present project limits.

BALANCE AND CONSISTENCY IN PLAN ESTIMATES

K. C. MAJUMDAR and R. DHAR

The estimation of active labour force available for different categories of employment has to be based on a detailed analysis of the growth of population by age and sex and the rate of the present and anticipated future participation of the labour force in various economic activities. In this article the authors discuss the method for obtaining a set of estimates of aggregate and sectoral economic variables for short-term and long-term planning. They deal with two aspects such as consistency amongst the various estimates and the several economic balances.

THE problem of obtaining the estimates of various economic activities for short and long term planning when the national goals and policies are specified has to be studied by considering the different aspects of inter-relations among the various activities both in magnitude and direction. One way of analysing it is to estimate the aggregate and sectoral targets in respect of output, investment, exports, imports, consumption and such others by adopting the three successive stages:

- Macro-balances,
- Input-Output analysis and
- Material balances.

The procedure involved in each of these analysis and their inter-connections are discussed here.

Macro-balance

National goals are usually specified in terms of aggregate economic factors. For example, a specified minimum level of either per capita income or expenditure to be achieved by a certain time may be the foremost goal in drawing up the details of a plan. It is, therefore, essential to project first the aggregate economic levels. This is usually done with the help of a simple macro-economic model, which is a handy tool to obtain an aggregative balanced picture of an economy. In its simplest form it covers items like income, consumption, saving and investment, exports and imports. These variables are related through a system of definitional and behavioral relations, such as:

- | | | |
|-------------------|---|------------------------------------|
| (i) Income | = | Consumption + savings |
| (ii) Savings | = | Average saving propensity × income |
| (iii) Foreign aid | = | Imports—exports |
| (iv) Investment | = | Savings + foreign aid |

As a first step towards estimating the macro-economic variables, one may assume a desired level of income to be achieved within a possible range of time. The desired level of income may be based on the goal of providing a minimum level of living for every individual. The time taken to achieve this goal will, however, depend upon the availability of domestic as well as foreign resources.

Domestic savings depend upon the propensity to save, while foreign resources depend upon the loans and aids from foreign countries. The propensity to save depends upon the saving tendencies of the private, corporate and public sectors. The domestic savings may tend to increase depending upon the government's policy of promoting and attracting different savings schemes. In the same way, government can also encourage a higher rate of savings in the corporate sector by allowing different types of tax rebates. Government's effort may also be directed towards the increase in their own savings by reducing uneconomic expenditure on current account and by taking measures of increasing taxes. However, any measure of increasing taxes should be so chosen that it increases the overall savings of the three broad groups. Another important measure of supplementing saving may be to resort to deficit financing. The level of deficit financing should, however, be limited to the extent to which it is possible to be matched up more or less by the additional output.

While domestic savings is no doubt important for raising the level of income, the foreign resources is an important helping factor in setting the pace of growth of the economy in underdeveloped countries. As mentioned earlier, the quantum of foreign resources depends upon the net imports of goods and services. The aggregate level of exports and imports are estimated on the basis of past trends and the possible improvement in respect of export promotion and import substitution. As in the initial period of development the imports are likely to be higher than the exports because of large demand for foreign machinery, the gap has to be filled up by foreign loans and aid. While foreign loans depend upon the credit worthiness and the rate of interest offered, the foreign aid depends on the aid programmes of the aid-giving nations and the likely share of this country.

The domestic savings and the foreign resources having been ascertained, the total investment will be known as the latter is equal to the sum total of the former two items. The implicit incremental capital to output ratio (ICOR) can then be calculated from this investment and the change in income between the base and the target year. The consistency of this ICOR has to be checked from an independent information on the past

ICOR figures for different periods and possibilities of changes in it during the period under consideration. These changes may occur due to several reasons of which the most important may be the changes in the domestic output basket as a result of the growth of new capacities.

With pre-assigned level of income and estimated savings the aggregate consumption level is obtained as a residue. This consumption, however, includes also consumption by the public authorities, which being autonomous in nature, has to be ascertained from government policy decisions. The difference between the total aggregate consumption and the government consumption will give the private consumption. Knowing the rate of growth of population on the basis of expected death and the birth rates, the implicit per capita rate of growth of the aggregate private consumption can then be worked out. This growth rate of per capita private consumption is consistent with the various assumptions involved in the macro economic analysis.

Input-output Analysis

The next problem is to estimate the mutually consistent levels of output in different sectors. This may be carried out by input-output analysis. The underlying features of this approach are :

(i) The economy is divided into a number of homogeneous sectors covering agriculture, mining, industries and services groups.

(ii) The final uses in the target year e.g., domestic and government consumption, gross fixed investment, exports, imports and changes in stock, in respect of each of the sectors are separately estimated.

(iii) The output levels of these sectors are unknown variables. These are determined from the solution of a system of simultaneous equations, where the coefficients of the variables are formed from technological relationships relating input to output, the constant part of each of the equations being the sum of the final uses of the corresponding sector.

Sectoral Demand

The sector-wise details of the final uses may be obtained from the aggregate of the items as obtained in the macro-balance. This may be done as follows :

(i) *Domestic consumption* : One of the commonly used method of estimating the sectoral consumption makes use of the concept of income/expenditure elasticities, the given rate of growth of population and the aggregate consumption. The elasticities which mean the rate of growth of consumption of a particular item relative to the rate of growth of the total income/expenditure, are calculated generally from the cross-section data on consumer expenditure collected through the National Sample Surveys. These elasticities are used for projecting the consumption for future with modifications, if considered necessary.

(ii) *Government consumption* : The sectoral estimates of the government consumption is obtained by breaking down the aggregate figure of the macro-balance, according to the sector-wise proportions of the latest year. These proportions may change due to change in the composition of government expenditure on different heads and in such cases the expected changes in the proportions are incorporated in the analysis.

(iii) *Investment* : There are three distinct aspects of investment each of which needs separate treatment.

(a) *Net fixed Investment* : There are various ways of treating this investment in the input-output models. The distribution of total investment between the sectoral categories may be assumed to follow the pattern of the latest year for which category-wise break down is available. This procedure is more or less the same as in the case of government consumption. Here also the proportions involved may change with the change in the sectoral composition of output as a result of any expected change in the relative rates of growth of the different sectors. This type of subjective judgement on the change in the proportion of investment items may be avoided by treating the investment as a function of change in output of every sector through some capital coefficient.

(b) *Replacement* : The replacement investment is estimated by using the information on the expected life of each capital item like buildings, machines, etc. and the level of expenditure involved for replacement.

(c) *Changes in stocks* : This is usually taken as a fixed percentage of change in output in each sector and as such is estimated as a function of the change in output in the input-output model.

(iv) *Exports* : The level of export of each sector is determined on the basis of (a) possibilities of external demand for various types of Indian products and (b) government's policy on export promotion and (c) the domestic supply possibilities.

(v) *Imports* : In a developing economy where new capacities are gradually built up it is necessary to distinguish the competitive and non-competitive types of imports.

The demand for non-competitive imports as an industrial input will depend upon the technology adopted. This demand can be calculated through import coefficients. The demand for non-competitive imports for consumption purposes can be kept at the minimum through governmental policies.

The competitive imports may be treated in the same way as the non-competitive imports except that the schedule of import substitution programmes has also to be considered. The level of import substitution will depend upon the planned growth of domestic capacities for the imported items. Another aspect of import substitution is to use that technology which will minimise the use of imported inputs. These aspects of import substitution can be tackled by suitably adjusting the

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Mauritius Plans For Economic Betterment

An Indian Techno-Economic Survey Mission, which was invited by the Government of Mauritius to study and recommend measures for the all-round development of their country, has submitted its report. The survey was undertaken in pursuance of a decision taken during the visit of the Prime Minister Mrs Indira Gandhi to Mauritius in June 1970. The report was presented on March 1, 1971 to the Prime Minister of Mauritius, Sir Seewoosagur Ramgoolam, who described it as a "very valuable document." The six-volume report deals with the promotion of animal husbandry, fisheries, mining, forestry and industrial technology. The author was the leader of the Mission.

G. C. BAVEJA

MAURITIUS is a small volcanic island situated in the south-west of the Indian Ocean about 800 kilometers off the east coast of Madagascar. It has a population of about 800,000. With an average density of more than 1,100 per square mile it is one of the most heavily populated agricultural countries in the world. Mauritius has an extreme form of mono-crop economy. Sugar is its mainstay inasmuch as it occupies 94 per cent of the arable land, contributes about 94 per cent of the exports and provides 47 per cent of the total employment.

Mauritius has strong ethnic and cultural affinities with India. Sixty eight per cent of its people are descendants of Indians who migrated there particularly from Eastern U.P. and Bihar on account of demand for labour in the sugar plantations following the abolition of slavery in 1830. The trade between India and Mauritius at present is very limited and is only in one direction. Mauritius imports from India mainly textiles, footwear, onions, spices, pulses and cinema films. The annual imports are worth Mauritian Rs 12 million (Indian Rs 16 million) and form only

3 per cent of the total imports of Mauritius. A number of Indian industrialists are, however, keen to set up joint ventures in Mauritius.

One of the most immediate and disquieting problem in Mauritius is that of growing unemployment which is estimated to be of the order of 36,000 or about 15 per cent of the economically active population. The Mission has, therefore, taken care to ensure that the projects recommended in the report provide adequate employment opportunities along with balanced growth. The main recommendations made in the report are discussed here.

Livestock

Mauritius has 42,000 dairy cattle, 3,700 other cattle, 66,000 goats and 3,000 pigs. There are about 22,000 cow-keepers who constitute one of the most economically backward segments of Mauritian population. Mauritius has to depend on imports of dairy and livestock products, live animals and raw materials for cattle feed worth Rs 29 million, while the value of local livestock products is estimated at Rs 20 million annually. The per capita consumption of various animal products is still far below the minimum level of nutritional require-

ments. In order to improve the lot of cattle breeders and cow-keepers, the report has suggested specific projects for animal breeding, animal nutrition and animal health. Stress has been laid on provision of artificial insemination and minimum veterinary facilities during holidays, intensification of fodder production, intensification of stomoxys control, construction of modern cow byres, mixed farming, poultry and pig development and better utilisation of carcass for producing meat and bone-meat tallow and allied products. These measures are expected to double the value of livestock produce during next ten years.

The total annual consumption of fish in Mauritius is estimated at about 5,850 tonnes out of which about 1,600 tonnes are imported and 4,250 tonnes are locally produced. The main catch is obtained from lagoons and is estimated at about 2,000 tonnes caught by 3,100 regular and 400 occasional fishermen. The rest of the catch is obtained from deep-sea fisheries and from Rodrigues, which is a separate island and a dependency of Mauritius. Fresh-water resources like reservoirs and ponds have not been exploited so far. The report has particularly surveyed the inland fishery resources and drawn up a programme of stocking if reservoirs and ponds with fresh water fish, including annual phasing of fish fry requirements, induced breeding of recommended species and improving fertility in reservoirs.

The improvement of existing Government barachois and leasing them to groups of fishermen and the conversion of additional 2,500 acres of lagoon into new barachois have also been recommended along with schemes for improved shark and octopus fishery and rab culture.

The setting up of a small viable unit for extracting, processing and bottling shark liver oil, the creation of marine parks at vintage coastal points and a public aquarium in Port Louis have also been proposed. The cumulative result of the schemes suggested in regard to fisheries and marine resources would not only improve the lot of some 4,000 fisher-

Significant Contribution Made by Indian Techno-Economic Survey Mission

men, but also significantly increase the tourist potential of the country.

Forests

According to land utilisation statistics, about 40 per cent of the total area of Mauritius is classified as forests. This classification is defective as the plantations and real evergreen forests hardly occupy 7 per cent to 8 per cent of the total land area. Mauritius has, therefore, to import considerable quantity of timber from outside. The total value of imports of forest products was approximately Rs 7 million in 1968. In the past, plantations of varying growth have been diverted for tea cultivation which is of considerable importance for the diversification of agricultural economy and provision of increased employment opportunities to small holders. This has resulted in an avoidable loss of about Rs 30 million. The Government of Mauritius has a further programme of increasing the area under tea cultivation from 11,000 acres to 30,000 acres by diverting the land from Crown forests and marginal sugarcane areas. The Techno-Economic Survey Report underlines the need for clearly demarcating areas of Crown lands for tea and forest plantations respectively. The report has also recommended new plantations of 17,000 acres of forests by 1980, the preparation of a working plan for management and development of Crown forests as well as private forests, construction of 128 kilometres of forest roads for better utilisation of forest resources and creation of a National Park for added tourist attraction, involving a total outlay of about Rs 29 million.

Industries

Till 1960, the only important industry in Mauritius was sugar. In 1963, the Government declared its policy of encouragement of industries and announced fiscal and other incentives. Subsequently, the Government set up the Development Bank

in 1964 to sanction loans at reasonable rate of interest to prospective entrepreneurs. Recently, the Government announced a host of incentives for industries to be set up in the Export Processing Zone. No doubt, a number of new industries on a small scale have been set up during the last decade but the industrial development so far has not been commensurate with the requirements of the economy.

The Mission has surveyed all the existing industries and has listed industries which are capable of expansion, such as tea, furniture, metal products, reinforced plastics, etc. So far as new industries are concerned, emphasis has been put on setting up industries based on local resources, namely, bagasse, molasses and coral sand, and availability of local market. Twentyfive new industries for which techno-economic feasibility has been established have been listed. While some of the industries like cement, chlorine and caustic soda, paper/newsprint, grey card board and PVC will make use of the available raw materials in the country, other industries such as nylon fish nets, fish hooks, electrical accessories and appliances and agricultural tools and implements will cater to domestic market.

Among other industries, caffeine, nicotine sulphate, PVC pipes and fittings, metal and tin containers, cement pipes, poles and sheets, pesticides, shark liver oil, cane wax, bakers' yeast, mono-sodium glutamate and cattle feed have prospects of establishment in Mauritius. For a large number of new industries, the report has given project profiles which indicate the size of the unit, the capital required, water and power requirements and employment created.

An assessment of the country's resources in basalt, trachyte, coral sand, ceramic clay, phosphorite and other minerals, has been made by the Mission and schemes suggested for the establishment of chemical and mineral based industries, including

cement, ceramics and ancillary products, on a priority basis for meeting the country's requirements and for exports. A list of chemical industries utilising the calcium carbonate in coral sand has been drawn and suggestions made for a detailed study to ascertain which of these industries have an export potential for Mauritius.

The development of ground water resources on a priority basis has also been recommended.

The Report has further stressed the need for diversification of agriculture. It has suggested increase in the production of rice, tea, groundnut, potatoes and vegetables and fruits, land reform measures, intensification of family planning and development of tourism.

INDUSTRIES IN BACKWARD AREAS

In order to promote industries in industrially backward areas by providing special incentives, about two hundred districts have so far been selected in different States by the Planning Commission from among those proposed by the State Governments. In addition, eight Union Territories have also been selected for the purpose.

For setting up industries in the selected 199 districts, special concessions are extended to entrepreneurs seeking credit facilities from some of the all-India financial institutions.

This concessional finance is offered by the Industrial Development Bank of India, the Industrial Finance Corporation of India and the Industrial Credit and Investment Corporation of India to small and medium scale industries in the selected districts. The concessions include lower rates of interest, and longer amortisation period for repayment of loans.

UNHINDERED PROFESSIONAL STEWARDSHIP ALONE



"THE Government is not a proper agency for running dairies. This idea has now been accepted by almost all the State Governments. Delhi is unlikely to be sensitive to farmers. That is one reason why the Headquarters of the National Dairy Development Board is located in Anand, a small town and the seat of the biggest group of cattle farmers' cooperative societies," said Dr V. Kurien, Chairman of the National Dairy Development Board and the Indian Dairy Corporation in the course of an exclusive interview with YOJANA in Trivandrum. The short, stocky and ebullient Dr Kurien is better known in India and among dairymen all over the world as the General Manager of the Kaira District Cooperative Milk Producers' Union Ltd., popularly known as AMUL. He was in Trivandrum recently to participate in the Eighth Dairy Industry Conference. I was keen to know from the man who is the motive force behind the country's largest dairy products complex, as to what was the secret behind the phenomenal success of Kaira.

"Leadership, the type of leadership many cooperatives in India did not have," asserted Dr Kurien and added: "You can well imagine the leadership a man like Sardar Vallabhbhai Patel could provide. Kaira was Sardar Patel's creation. It

CAN SOLVE PROBLEMS OF COOPERATIVE ENTERPRISES

they were being exploited by the middlemen. They were not new to such kind of exploitation which they, as farmers of wheat and tobacco, had already suffered. But milk, unlike wheat or tobacco, had to be marketed within two hours of production and twice a day, throughout the year. The odds were against the farmers.

A new chapter opened in 1946. Let out of jail, Sardar Patel came to his village, Karamsad, just three Kms from Anand. He heard the farmers' tale of woe and was touched

'COOPERATISE' DAIRYING

Says Dr V. KURIEN, Chairman, National Dairy Development Board and General Manager of the nation's biggest dairy complex, in an interview with ROSSCOTE KRISHNA PILLAI, Our Trivandrum Correspondent.

was he who gave the idea and the inspiration to the farmers there."

After the Bombay Milk Scheme was started around 1945, the provincial government began collecting surplus milk from Kaira District in Gujarat and marketed it in the city. It was the first time in India that milk was collected from such a far-away place and sent over a long distance. Anand is over 425 Kms. north of Bombay city. The pasteurisation of this milk was entrusted to Polsons. The Bombay Government started making profit and pooled the surplus money in a Milk Fund. With that money they built Aarey, the first large dairy, in 1950. The State Government made a profit of about Rs one crore from the milk collected at Anand after meeting the expenses involved in bottling and distribution. Polsons were happy because they could sell their shares. Milk contractors were also happy because they were "literally skimming the cream". Only the farmers of Anand were unhappy. They were aware that

to the quick. The man of action took no time to find a solution: "Cooperatise the dairy!" The cattle farmers must form themselves into a cooperative. The processing of milk must also be done by the cooperative. Only then would the farmers get the benefit of their efforts. Sardar Patel started organising the farmers. The then Bombay Government read into Sardar Patel's action more than what he really meant. They would not agree to buy milk from the farmers' cooperative. Sardar Patel, the man of immense foresight that he was, knew that there would have to be a fight. The farmers passed a resolution to the effect that they would not sell milk to the Bombay Government unless the Government bought it from the Kaira Milk Producers' Union. The Government would not agree. The expected crisis developed. Sardar Patel could not be there on the spot. He sent his deputy who organised the first milk strike. Not a drop of milk went from Anand to Bombay. The

strike lasted 15 days. Ultimately the Bombay Government had to yield.

Kaira now stands on its own. Its targets are not fixed by someone in Delhi. These are fixed and achieved by the farmers themselves. It is not, as Dr Kurien said, "an emaciated body depending on blood transfusion every moment."

The dairy wizard told me how the "biggest enemy" of the Kaira District Cooperative Milk Supplies Union turned out to be the Bombay State's Dairy Department itself. "Anand milk was cheaper but still Aarey wanted to set up its own dairy. We opposed it," said Dr Kurien without a tinge of resentment or illwill in his expression. He went on to say that the Government would not easily realise that a cooperative which was unduly spoon-fed could only be a week child."

Professional Stewardship

What else than leadership made Kaira a success, I enquired.

"Executive management done by professionals," Dr Kurien said emphatically. "Every section, every department of the dairy complex is managed by men trained in different fields of management. All our managers go through management training. Fifty of them were trained abroad. And our staff is not changed. Nor would they leave us. Why should they? We pay them well. A sweeper in our complex gets Rs 250 when he joins. This is twice as much as anyone could get elsewhere in the same capacity. Yet, our total salary bill is only three per cent of our total sales. This is in sharp contrast to what happens in public sector concerns where the salary bill takes away a good chunk. All the workers are insured and we pay the premia. Above all, we have a Board which has never interfered in the day-to-day administration and has given absolute freedom to the management to take the best people from anywhere in India and not only from Kaira."

Dr Kurien told me that the person selected by Sardar Patel's deputy to be the Chairman of the Board of Management of the Cooperative Union has remained the Chairman all these 24 years. And this despite the fact that the Board is elected every year by the farmers! The General

Manager is responsible to the Board but neither the Chairman nor any of the Board members has ever asked the GM to appoint anyone of their choice. No Board member initiates any appointment. There is no appeal to the Board against any decision of the General Manager. But in regard to the finances of the dairy, there are several vigorous checks. There is an internal auditor who can report to the Chairman direct without the knowledge of the General Manager. In addition, at the request of the Kaira Union, the Gujarat Government conducts continuous and concurrent audit.

There is very strict quality control of all the products of Amul.

"Our quality control manager is always right," said Dr Kurein with visible pride. "There is no appeal; his is the last word. Once, on the basis of his judgement, we threw away 50,000 lbs of butter. Our factory lost Rs 75,000, but we could not help it. We have to keep our reputation. We don't have to worry, as Government officers have to, about audit and accounts questions on scrapping something useless. Similarly if a plant superintendent decided something in the interest of efficiency or quality of the factory's products there was no interference from managers above him."

What are the lessons the Kaira success story has for dairying in other parts of the country, I asked.

Rural Employment

"Kaira has shown how large is the rural employment potential of dairying," answered Dr Kurien, adding that 1,81,000 farmers of Kaira district are in this cooperative. If, on an average, a farmer's family consists of five, it would mean that at least a million people earn their living through milk. A Kaira farmer has, on an average, three acres of land and 'one and a half' buffaloes. As we progress with the Green Revolution and employ tractors in the field, more and more people will be released from work on the fields. Then dairying will gradually cease to be a subsidiary occupation. In Kaira, 50 per cent of the farmers' total income comes from milk. In 1948, we collected and processed 220 kgs of milk a day. In 20 years, this rose to 500,000 kgs a day. The turnover in

1968-69 was worth Rs 24 crore. In fact, ours is the biggest dairy complex in the country. "There are other lessons, too," he added, "like exposure to modern ideas and techniques. The farmers come to know how clean milk is produced; how cattle feed compounding is done; how people queue up for milk; how artificial insemination is done. Both men and women folk see several of the 200,000 inseminations done in a year. All this means education in hygiene, sanitation, and scientific knowhow."

Has Amul's example been emulated? I asked.

"Oh, yes. Quite a few dairy products organisations have come up on the pattern of Anand; in Mehsana, Baroda, Ahmedabad and so on. In fact, it was Anand's success that prompted the Government of India to set up the National Dairy Board. At Mehsana has come up the Dudhsagar Dairy, the second biggest dairy products organisation in the country. Kaira provided the knowhow without levying any fees. The Dairy at Mehsana is an independent organisation and is bigger than Glaxo or Nestles."

Dr Kurien does not believe in guided cooperatives. He told me: "When the Government nominates its officers to run cooperatives, how can they succeed? The 21 years of Kaira make this fact self-evident."

WFP AID FOR IRRIGATION WELLS IN BIHAR

Under an agreement, the United Nations/FAO World Food Programme would provide food assistance worth \$831,000 to be distributed as part payment of wages to labourers engaged in digging irrigation wells in four drought-prone districts of Bihar. According to the Plan, 3,500 surface percolation wells will be constructed in the districts of Gaya, Hazaribagh, Palamau and Ranchi. This is considered the most economical way of tapping the existing ground water resources for irrigation. A total of 3,144,000 man days will be employed over a period of two years.

WFP has committed 6,288 metric tons of wheat to the project.

THE LITTLE RED HEN

AN American journal, *Sebastopol Times* of California recently published the following apocryphal story, which has a moral that is quite obvious.

Once upon a time there was a Little Red Hen who scratched about and uncovered some grains of wheat. She called her barnyard neighbours and said, "If we work together and plant this wheat, we will have some fine bread to eat. Who will help me plant the wheat?"

"Not I," said the Cow. "Not I," said the Duck. "Not I," said the Goose. "Then I will," said the Little Red Hen—and she did.

After the wheat started growing, the ground turned dry and there was no rain in sight. "Who will help me water the wheat?" said the Little Red Hen.

"Not I," said the Cow. "Not I," said the Duck. "Not I," said the Pig. "Equal rights," said the Goose. "Then I will," said the Little Red Hen—and she did.

The wheat grew tall and ripened into golden grain. "Who will help me reap the wheat," asked the Little Red Hen.

"Not I," said the Cow. "Not I," said the Duck. "Out of my classification," said the Pig. "I'd lose my ADC," said the Goose.

"Then I will," said the Little Red Hen—and she did.

When it came time to grind the flour, "Not I," said the Cow. "I'd lose my unemployment compensation," said the Duck.

When it came time to bake the bread, "That's overtime for me," said the Cow. "I'm a dropout and never learned how," said the Duck. "I'd lose my welfare benefits," said the Pig. "If I'm the only one helping, that's discrimination," said the Goose.

"Then I will," said the Little Red Hen—and she did.

She baked five loaves of fine bread and held them up for her neighbours to see.

"I want some," said the Cow. "I want some," said the Duck. "I want some," said the Pig. "I demand my share," said the Goose.

"No," said the Little Red Hen. "I can rest for awhile and eat the five loaves myself."

"Excess profits," cried the Cow. "Capitalistic leech!" screamed the Duck. "Company fink," grunted the Pig. "Equal rights," screamed the Goose.

And they all hurriedly painted picket signs and marched around the Little Red Hen singing, "We shall overcome." And they did.

For when the Farmer came to investigate the commotion, he said, "You must not be greedy, Little Red Hen. Look at the oppressed Cow. Look at the disadvantaged Duck. Look at the underprivileged Pig. Look at the less fortunate Goose. You are guilty of making second-class citizens of them!"

"But—but—but I earned the bread," protested the Little Red Hen.

"Exactly," the Farmer said. "That is the wonderful free enterprise system; anybody in the barnyard can earn as much as he wants. You should be happy to have this freedom. In other barnyards, you would have to give all five loaves to the Farmer. Here you give four loaves to your suffering neighbours."

And they lived happily ever after. Including the Little Red Hen, who smiled and smiled and clucked, "I am grateful. I am grateful."

But her neighbours wondered why she never baked any more bread.



IGNORAMAN

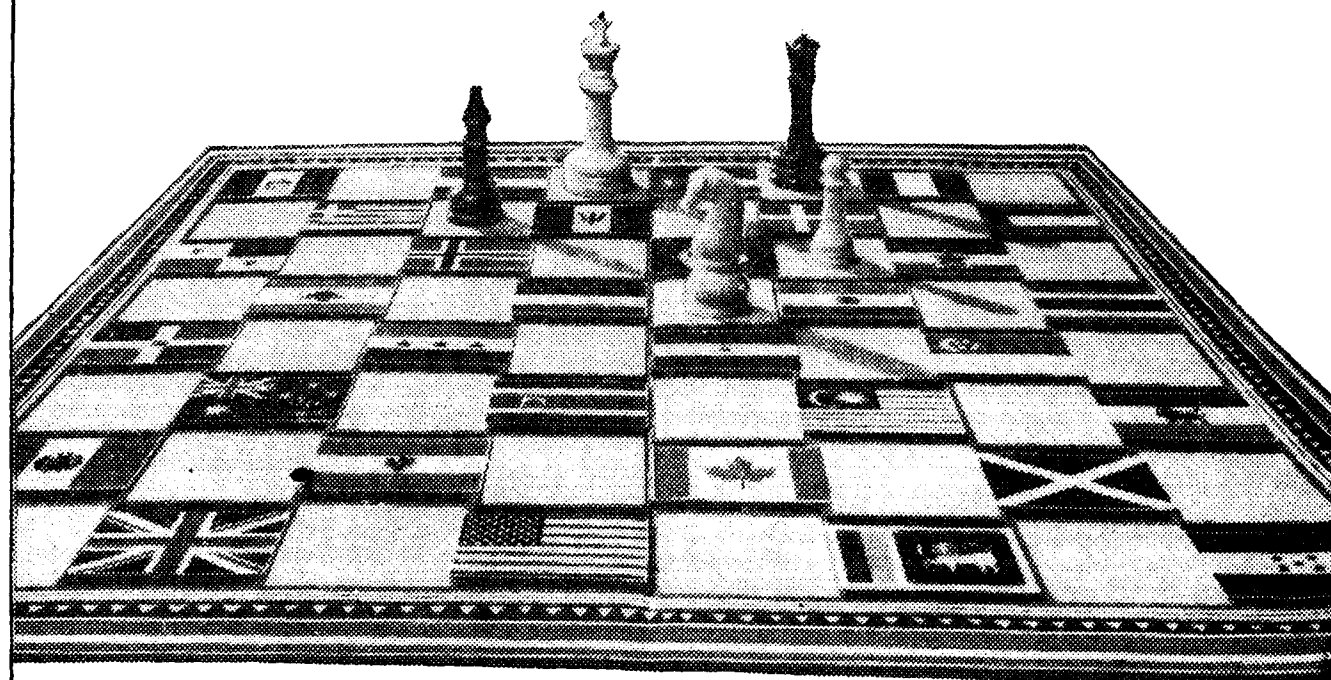
*Wants To Know
If
a "landslide" does not
mean burial without
funeral*

FIRST JUMBO JET OF AIR-INDIA

The first of the three Boeing-747's named Emperor Ashok, is to be handed over to Air-India on March 23 and is expected to land in Bombay some time in April—marking the advent of Jumbo Jet on Air-India's world routes.

The airlines has maintained a steady rate of growth in 1969-70 though profitability declined due to rising cost. Air-India's operating profit at Rs 4.3 crore and the net profit at Rs. 2.27 crore were lower than in the past year despite an increase of 11.2 per cent in gross operating revenues. Compared to the last year, the passenger traffic increased by 21.6 per cent. During the year Air-India carried 402,609 passengers as against 331,051 in 1968-69. AI's cargo service rose by 17.7 per cent from Rs 967.43 lakh in 1968-69 to Rs 1138.57 lakh in 1969-70. The Board of Directors has approved payment of 6 per cent dividend on the equity portion of the capital of Rs 13.41 crore. A sum of Rs 87.15 lakh was paid to the Union Government as interest on the loan capital.

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WORLD COOPERATION FOR GREEN REVOLUTION

DR NORMAN E. BORLAUG

IN 1943, several years before the establishment of the Food and Agricultural Organization (FAO) of the United Nations, a cooperative agricultural research and training programme was launched in Mexico. This was a pioneer cooperative project between the Mexican Ministry of Agriculture and the Rockefeller Foundation, initiated at the request of the Mexican Government for assistance in increasing the production of maize, wheat and beans and simultaneously to train new generation of scientists in all of the disciplines relating to wheat research. Research from the outset was production oriented and restricted to that which was relevant to increasing wheat production. Researches in pursuit of irrelevant academic butterflies were discouraged, both because of the acute shortage of scientific manpower and because of the need to have data and materials available as soon as possible for use in the production programme.

To accelerate progress in varietal development, two generations of all segregating materials were grown each year. One generation was sown close to sea level in Sonora at 28 degrees north latitude in the fall when the days were progressively shorter; the second was sown near Toluca, at 18 degrees latitude and 2,500 meters above sea level during the summer when days were progressively longer. Through the use of this technique we developed high yielding, day length insensitive varieties with a wide range of ecologic adaptation and a broad spectrum of disease resistance — a new combination of uniquely valuable characters in wheat varieties.

These characters were valuable in increasing wheat production in Mexico and neighbouring countries, but were to prove even more valuable 20 years later when the Mexican varieties were introduced into Pakistan and India. Without this combination of characters the successful transplantation of the Mexican varieties into Pakistan and India would have been impossible; and the advent of the Green Revolution would almost certainly have been delayed many years. We never waited for perfection in varieties or methods but used the best available each year and modified them as further improvement came to hand. This simple principle is too often disregarded by scientific perfectionists who spend a life-time searching for the unattainable in biological perfection, and consequently during a life-time of frustration contribute nothing to increasing food production.

Farm demonstrations of new varieties and technology were made by the research scientists who had developed them. Indeed, the revolution in wheat production in Mexico was accomplished before the extension service

Based on Dr Borlaug's Convocation Address at the U.P. Agricultural University at Pantnagar on March 16, 1971.

came into being. This forced the research scientists themselves to consider the obstacles to production that confronted the farmers. Mexico became self-sufficient in wheat production for the first time in 1956, and has remained self-sufficient since. This "Quiet Revolution" in wheat production in Mexico became the progenitor of the Green Revolution in India and Pakistan a decade later.

As the use of fertiliser increased and yields climbed to 4.5 thousand kilos per hectare, lodging (falling over of the plant) began to limit further increase in yields. A search was, therefore, made among wheats from different areas of the world to locate a suitable source of genetic dwarfness to overcome this barrier. The dwarf Mexican wheats were first distributed in Mexico in 1961, and the best farmers began to harvest 5,6,7 and even 8 tonnes or more per hectare and within seven years the national average yields doubled. It was these same dwarf Mexican wheats from the Quiet Revolution that served as catalysts to trigger off the Green Revolution in India and Pakistan.

From the outset the Mexican Agricultural Programme was watched with interest by many other countries. As progress became evident the Rockefeller Foundation was besieged by requests from many other countries for assistance in agricultural improvement programmes. India made such a request in 1963.

Although the Mexican experience indicated that one of the greatest obstacles to the improvement of agriculture in the developing countries is the scarcity of trained and experienced people, India was unique in the availability of trained scientists. In countries where no corps of trained scientists exists, as was the case in Mexico 27 years ago and remains the case in many countries of Asia, Africa and Latin America today, it requires 18 to 25 years to develop enough competent research scientists and educators to meet a country's needs. So great is the urgency of the food shortage in many under-developed and emerging countries that there is not enough time to develop an adequate corps of scientists before attacking food production problems. A short-cut and organizational change had to be invented to meet the needs. And so was born the first truly international research and training institute — The International Rice Research Institute (IRRI) at Los Banos, the Philippines, in 1960, to work exclusively on the regionally all-important but too long neglected rice crop. The Institute was jointly financed by the Ford and Rockefeller Foundations in collaboration with the Government of the Philippines.

The research activities on wheat, maize and potatoes in Mexico were informally internationalized in 1959 and organized as a second international centre in 1963. This International Centre for Maize and Wheat Improvement (CIMMYT) is supported also by the Ford and Rockefeller Foundations, in collaboration with the Government of Mexico. More recently, additional financial support has been provided by the US Agency for International Development (USAID), United Nations Development Programmes (UNDP) and the Inter-

American Development Bank (BID).

There are now four international institutes in operation or being organized. They represent a significant but modest start towards the construction of world-wide network of international, national and local research and training centres. This network will help solve problems and disseminate the benefits of science to all mankind in the shortest possible time and at minimum costs.

COOPERATION

The impact of such integrated approach is already evident in the Green Revolution. New varieties and the new technologies that make them highly productive have been the thrust behind the Green Revolution. In the Philippines, Ceylon, Malaysia and West Pakistan it was IR-8 rice, developed at the International Rice Research Institute. The dwarf Mexican wheats, partly produced by CIMMYT, have provided the thrust in India and Pakistan and this is now spreading to Turkey, Afghanistan, Iran, Morocco and Tunisia. Contributing equally, or perhaps even more, to the evolution of the Green Revolution was the talented supporting leadership that has been provided by the Centres to the national programmes through temporary assignments of mature scientists skilled in organizing crop production programmes to assist in the development of the national production campaigns.

The international centres were developed to supplement national agricultural research, production, and training programmes, not to replace them. The centres are but one link in the world-wide network of organizations attacking basic food-crop production problems on a world-wide, regional, national and local level. The backbone of this network is now and must continue to be the national programmes. They must be given greater financial support and strengthened staff-wise to meet the challenge of rapidly expanding food needs for the future.

The international centres, however, are in a unique position to assist the national programmes. They are independent, non-political, international organizations, which, although originally funded by private foundations, now receive support from many diverse sources. Their scientific staffs are also international and comprise outstanding scientists representing the various scientific disciplines affecting crop production. Included on their staff are a number of crop production experts who have the scientific competence and broad experience to assist national agencies in organizing and launching crop production programmes.

The centres collaborate not only with the national agencies from many different countries but also with other international organizations such as the Food and Agricultural Organization (FAO) of the United Nations, the United Nations Development Programme (UNDP), and international development banks. Each year the centres have been collaborating with an increasing number of countries of all political spectra.

I am convinced that the international agricultural research institutes are developing a bond of understanding among nations, based upon the common needs for increasing food production. We must all strive to strengthen this bond.

The international centres are uniquely equipped to do fundamental, long-time researches of world-wide importance. For example, the opportunity for plant breeders, pathologists and entomologists to operate on a world-wide basis permits them to develop well conceived, diverse gene pools of the important crop species. The final crop varieties are not currently generally selected at the centres but sent to collaborators in national programmes in many parts of the world who, in turn, make the selections that best suit their needs and many eventually become commercial varieties. Similarly, the centres prepare a series of international crop yield tests, which include representatives of the best commercial varieties from the world and a few of the most promising experimental lines from collaborators. These are sent to collaborators in 35 countries for growing at 80 locations. The data from collaborators are returned to CIMMYT for summarising and for subsequent distribution to scientists in all parts of the world. The data obtained on yield, adaptation, disease and insect resistance in one year in such tests are often more meaningful and valuable to scientists engaged in crop research and production programmes than data obtained by independent testing at one location for a period of 10 or 15 years.

The international centres also are in unique position to contribute to practical or internship type of training in all of the scientific disciplines affecting crop production. This type of training is particularly valuable for young scientists from the developing countries because it prepares them for initiating research work upon return to their native country and will also be of value if they subsequently continue their education at the graduate level.

In summarising the accomplishments of the Green Revolution during the past three years, I wish to restate that the increase in cereal production, rice, maize and wheat, and especially in wheat, has been spectacular and highly significant to the welfare of millions of human beings. It is still modest in terms of total needs. Recalling that 50 per cent of the present world population is undernourished and that an even larger percentage, perhaps 65 per cent, is malnourished, no room is left for complacency. It is not enough to prevent the currently bad situation from getting worse as population increases. Our aim must be to produce enough food to eradicate all present hunger while at the same time striving to correct malnutrition. To eliminate hunger now in the developing nations, we would need to expand world cereal production by 30 per cent. If it were, however, as simple as increasing the total world production by 30 per cent, regardless where the production is to be expanded, it could be accomplished rather rapidly by expanding it in the United States, Canada, Australia, Argentina, and Russia. But this would not necessarily solve the hunger problem of the developing world, because their weak economics will not permit them to expand their food imports by 30 per cent. Worse still, even if present production would be expanded rapidly by 30 per cent in the developing countries—which, I believe, is possible based on recent progress of the Green Revolution—so as theoretically to eliminate hunger, the hunger problem as it now exists still would not be solved. There remains the unsolved social,

economic problem of effective ways to distribute the needed additional food to the vast under-privileged masses who have little or no purchasing power. This is still the great unsolved problem with which the economists, sociologists, and political leaders must now come to grips.

I am convinced that if all policy makers would take sufficient interest in population control and in aggressively employing and exploiting agricultural development as a potent instrument of agrarian prosperity and economic advancement, many of the social ills of the present day could soon become problems of the past. The tropics and sub-tropics have abundant sunlight and other great biological assets and it will be criminal to delay further the conversion of these assets into wealth meaningful to the poor and hungry.

Some critics have said that the Green Revolution has created more problems than it has solved. This I cannot accept, for, I believe, it is far better for mankind to be struggling with new problems caused by abundance rather than with the old problem of famine. Certainly, loyalty to the *status quo* in food production when being pressured by population growth cannot break the chains that have bound the peasant to poverty and hunger. One must ask: Is it just to criticise the Green Revolution, with its recognized accomplishments, for failure to correct all the social-economic ills of the world that have accumulated from the days of Adam and Eve upto the present? Change we must, or we will perish as a species, just as did the dinosaurs in the late Cretaceous.

QUALITY

The Green Revolution is a change in the right direction, but it has not transformed the world into Utopia. None are more keenly aware of its limitations than those who started it and fought for its success. But there has been solid accomplishment, as I have already shown by concrete examples. I have also tried to indicate the various opportunities for capitalising more fully on the new materials that were produced and the new methods that were devised. And, above all, I cannot emphasise too strongly the fact that further progress depends on intelligent, integrated and persistent effort by Government leaders, statesmen, tradesmen, scientists and communication agencies, including the press, radio and television.

But progress is continuous, and we can and must make continuous progress. Better varieties of wheat and other cereals with not only higher yield potential, but also with higher content of protein are already in the process of creation.

We need also to explore more fully the feasibility of producing new man-made cereal species with greater production potential and better nutritional quality than those now in existence. Triticale, a man-made species, derived from a cross between wheat and rye, now shows promise of becoming such a crop.

I propose, therefore, that a bold programme of wide crosses be initiated to improve both cereals and legumes (pulses). It should include attempts to make numerous inter-genetic crosses among cereals, employing all of the modern techniques to consummate fertili-

sation, and propagate the hybrids. If a series of new combinations can be made and doubled, such as, for example, between maize and sorghum, wheat and barley, or wheat and rice, it would open the door to the possibilities for vast subsequent improvement by conventional methods.

The Green Revolution has won a temporary success in man's war against hunger and deprivation; it has given man a breathing space. It has produced a model wherein both coordinated national and collaborative international cooperation have played a vital role in the genesis of the Green Revolution. If fully implemented, the Revolution can provide sufficient food for sustenance during the next three decades. But the frightening power of human reproduction must also be curbed; otherwise the success of the Green Revolution will be ephemeral only.

Most people still fail to comprehend the magnitude and menace of the "Population Monster". In the beginning there were but two, Adam and Eve; when they appeared on this earth is still questionable. By the time of Christ world population had probably reached 250 million. But between then and now population has grown to 3.5 billion. Growth has been especially fast since the advent of modern medicine. If it continues to increase at the estimated present rate of two per cent a year the world population will reach 6.5 billion by the year 2000. Currently, with each second, or tick of the clock, about 2.2 additional people are added to the world population. The rhythm of increase will accelerate to 2.7, 3.3 and 4.0 for each tick of the clock by 1980, 1990 and 2000 respectively, unless man becomes more realistic and pre-occupied about his impending doom. The tic-tic of the clock will continually grow louder and more menacing each decade. Where will it all end?

Malthus signalled the danger a century and a half ago. But he emphasised principally the danger that population would increase faster than food supplies. In his time he could not foresee the tremendous increase in man's food production potential. Nor could he have foreseen the disturbing and destructive physical and mental consequences of the grotesque concentration of human beings into the poisoned and dangerous environment of pathological hypertrophied megapodes. Can human beings endure the strain? Abnormal stresses and strains tend to accentuate man's animal instincts and provoke irrational and socially disruptive behaviour among the less stable individuals.

We must recognize the fact that adequate food is only the first requisite for life. For a decent and humane life we must also provide an opportunity for good clothing, and effective and compassionate medical care. Unless we can do this, man may degenerate sooner from environmental diseases than from hunger.

And yet, I am optimistic for the future of mankind; for in all biological populations there are innate devices to adjust population growth to the carrying capacity of the environment. Undoubtedly, some such device exists in man, presumably *Homo sapiens*, but so far it has not asserted itself to bring into balance population growth and carrying capacity of the environment on a world scale.

STEPPING UP DEPOSIT MOBILISATION

M. R. HAZARAY

THE nationalised banks were expected to play a definite role in the country's overall economic development by raising the existing levels of savings and investment. It was expected that nationalisation would help capital formation and stabilisation of the general price level so that fruits of economic development could be directly enjoyed by the people without any fear of inflation.

The need for deposit mobilisation in the Fourth Plan of Rs. 24,398 crore magnitude has become all the more urgent as the prospects of foreign aid of Rs. 2,514 crore seem to be bleak and deficit financing must be kept to a minimum of Rs 850 crore.

At present there are only about 1,22,83,000 depositors and 1,09,000 borrowers. Their number must at least increase tenfold by 1981 in order to spread the banking habit all over the country. The per capita deposits today stand at Rs. 80.85 only which must be raised twice as much by 1981 to realise the target of 30% of national income saved as against 55% in Japan.

It is indeed a Herculean task, the recessionary trends in the industrial sector have to be reversed. The deposit mobilisation has fallen far behind the bank advances. The credit deposit ratio has jumped to 70%. The need for differential rates is acutely felt while the concept of lead banks has not proved as successful as it was made out to be. All this made the rise of the Bank Rate from 5% to 6% inevitable in order to put down the inflationary pressures on the economy.

However, it should not be altogether difficult to step up the rate of deposit mobilisation given the right approach on the part of our

nationalised banks. Sustained efforts will have to be made to mobilise deposits from every corner of the country and from all classes and sections of the population.

If dynamically viewed and intelligently tapped, our farming community, small-scale industrialists and the student community can prove to be potentially rich sources of deposits.

It is well known that agriculture is the mainstay of our economy. It provides 70% of employment and contributes about 50% to our national income. The "green revolution" has come to stay and we have been fortunate enough in harvesting four bumper crops in succession. Therefore, it should not be difficult to step up savings income ratio of rural households significantly which has remained stagnant since 1951. A compulsory savings scheme as in Nepal might be introduced in India with suitable modifications. In this scheme all farmers, rich or poor, are made to save both in cash and kind in order to finance agricultural development. It can be fruitfully extended to other sectors. This will help in checking wasteful expenditure effectively and increase marketable surplus and thus arrest inflation.

A New Approach

All this, of course, presupposes the adoption of a new approach and techniques on the part of our nationalised banks. They must fight back the bureaucratic forces in their working and begin to function in the language of the village people. In short, an altogether new strategy will have to be evolved by them.

It would be possible for them to convert *mandis* and marketing towns into ideal growth centres as shown

by Messrs Jakhade and Shivmaggi of the Reserve Bank of India in a study published by them for the identification of rural areas for branch expansion. Some of the public sector banks like the Syndicate Bank have completed their study of districts allotted to them; such studies too would be of great help in this respect. Similarly the State Bank of India has recently initiated a village adoption scheme wherein a package credit is granted to the entire village for digging wells, setting up water pumps, and for purchasing better seeds, fertilisers and implements. Moneylenders, who till now dominated the village scene, can also be appointed as agents and sub-agents of the nationalised banks to bridge the gulf between the organised and unorganised money markets and subsequently to stop the transfer of money from one into the other.

A thriving small-scale industries sector and a growing exports sector may also be served in some such suitable manner and those working in them can be brought to the counters of the bank both as depositors and loan takers by creating secondary securities and technical advisory bureaux.

Student Community

Today there are about 2 million students in 72 universities and 54 million youngsters in schools. Our young generation must be made to grow along with the banking habit. The example of thousands of Scottish School banks is inspiring enough for us. However, we should not overburden our school teachers for that sake; instead a one-man bank in every school is worth giving a trial. The service to our young would be doubly rewarding, for banks can finance education of deserving students and also encourage them to travel around the country. Similarly when it comes to selection of suitable personnel, banks can count upon this source and offer them promising careers. Investment in human beings can never be misplaced in the cause of economic development.

It would be educative again to draw upon the experience of foreign countries like the United States and Australia in their drives for deposit collection. The savings and loan banks in America have taken to advertising in the press, on the air

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LOOKING FORWARD TO RAPID INCREASE IN TOURIST TRADE

K. CHOWDHARY

TOURISM is "an industry without chimneys". The world tourist industry has an annual turnover about Rs 12,750 crore, with 20 crore tourists involved in travel. Its growth rate has been 9 to 10% per annum. India's income on account of international tourism is estimated to be Rs 33 crore with 45,000 foreign guests who visited the country in 1969.

By any reckoning, our tourist industry has made rapid strides in the past few years. The number of foreign tourists visiting India has risen from 1,34,000 in 1962 to 2,45,000 in 1969. The arrivals in 1970 are

New York to London (for a distance of 4,147 permitted miles) pays 2.97 cent per mile. He is called upon to pay 4.64 cent per mile on the additional 3,534 miles to cover his trip to Tehran, but to extend his travel by another 2,063 miles to Bombay, he would have to pay 5.24 cent per mile. It works out to be more economical to travel twice from Los Angeles to Hong Kong than to extend one visit to an additional 2,000 miles to Calcutta. It is time that India's tourist industry was freed from the shackles of unfavourable air fare structure.

Tourism contributed Rs 33 crore

Tourism ranks twelfth in the country's exports by commodity composition. Receipts from tourism have more than doubled during 1966-1969 and employment opportunities have increased manifold. If the number of tourists to this country should reach 400,000 by 1973, as planned, a rapid expansion in facilities using the techniques of science and electronics is imperative.

estimated to be close to 3,00,000 mark, representing a 20% increase over those in 1962.

In this context, it would be relevant to study the international travel tariff structure. The average rate per mile of the lowest published fare from some important sectors to destinations in India and *vice versa* are higher than those obtaining among centres in other sectors. It is paradoxical to learn that a Boeing 707 can be packed to its capacity between two points without two of the passengers paying the same fare. For instance differential and discriminating surcharge on travel to India is annoying. In the annals of present day air travel market, a passenger from

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to our foreign exchange earnings in the year 1969 against Rs 26 crore in the previous year and Rs 16 crore in 1966. Receipts from tourism have more than doubled over the period 1966-1969. The total earnings would be much more if the earnings from invisible exports, namely, the revenue accruing to our airlines, shipping companies, rail and road transport services for tourist journeys on international routes to and from India are taken into consideration. Tourism today ranks twelfth in order of India's exports by commodity composition.

Receipts on account of international travel are estimated on the basis of exchange control records. This in developing countries leads to an underestimation of earnings from tourism, as it fails to embrace the unofficial transaction of foreign exchange through un-

authorised deals and arrangements for reciprocal hospitalities. For instance, a dollar in India is sold for an amount between Rs 12 to 13 against the official rate of Rs 7.50. Similarly, a sterling in our country is sold at Rs 25 to 28 against the official rate of Rs 18. With such high rates of unofficial transactions, it would be wrong to presume that a cross section of tourists would not be tempted to convert their foreign currencies through unconventional channels. All these gaps must be taken into consideration for appraising the earnings through exchange control methods. One way, as mentioned earlier, is through the sample surveys of outgoing tourists conducted at the points of departure. Without any supplemental measures, the authorities would be at a loss to estimate the foreign exchange injected through the black market which is highly vulnerable to underestimation in a country like India due to the prevalence of very strict exchange control measures.

Like any other industry, tourist industry also comprises a number of enterprises dealing in the sale of goods and services to the tourist. The industry has been given its greatest support by many enterprises like carriers, hotels, restaurants, tour operators, curio and antique dealers, entertainment houses, *shikar* agents and a large variety of shopkeepers which together form the sheet anchor of the industry and are its principal beneficiaries. In this connection, the Department of Tourism has conducted a study called "A Survey of Expenditure, Composition and Reaction Pattern of Foreign Tourist in India" through the Indian Institute of Public Opinion, New Delhi. According to this study, a foreign tourist on an average spent Rs 1,368 during November 1968-October 1969. Of this total per capita expenditure, 42% has been estimated

to be spent on 'boarding and lodging including restaurants and entertainments, 26% on 'domestic travel', 28% to 'shopping' and the remaining on miscellaneous items. Hotels and restaurants and domestic transport agencies are the major beneficiaries of the tourist expenditure in India. Together these account for more than 70 percent of a tourist rupee spent in the country.

Employment Generator

Tourism brings in its wake a spurt of employment opportunities and employs the services, directly and indirectly, of contractors, manufacturers, traders, craftsmen, musicians, artists, hoteliers, waiters, porters, transport and tour operators, and a large number of public administration employees. The industry is highly labour-intensive and has a very high multiplier effect in generating more employment. Unfortunately, in India, research data on this aspect of the tourist industry is missing. In India, well-informed opinion maintains that about 2.5 million persons derive their direct employment on account of the foreign tourist arrivals in India.

Planning of tourism in India must concern itself with marketing research, product planning, tourist pack and mix and selling operations. All those concerned with planning and policy formulation of tourist industry need information for intelligent decision making. Through Marketing Research, information can be had on where Indian Tourism stands in the world tourist industry, the shape and structure of the industry and a host of other factors like the nature of demand for tourism, particular facets of travel the tourists seek and the images and impression they carry along with themselves.

Tourism market research consists of collection, recording and analysis of all the available facts relating to the sale of tourism by the producer (the country selling tourism) to the consumer (the potential tourist). The information needed includes: population and its density; income pyramids of the population with special regard to disposable income; the general purchasing power of the inhabitants;

quantum of investment and sources of income; economic trends; availability and the quality of transport and communication system; non-economic factors; place of publicity and its nature; tourist reactions and motivations and tourist potentials.

The demand for vacation trips abroad and/or the desire to go in for souvenirs and luxury articles is extremely sensitive to the variations in consumer's income. These variations, therefore, need to be carefully observed because the income elasticity of demand is indicative of the way in which consumer's purchases change according to the shift in his income.

There is also a psychological factor, namely, acquired habits. The potential tourists tend to take the beaten track and the countries which traditionally export tourists will continue to do so for some more time. The tourist arrival statistics of the past, the travel habits, the tourist reactions to the custom and frontier formalities of the host country, the number of youth hostels and tourist clubs, the cultural festivals etc. are various other items which have to be studied in depth.

'Tourist satisfaction' is the end product of the industry. The absence of an analysis of the quality of the product is tantamount to operating in the dark. So a great part of the research should include tabulation of reactions of tourists and the improvements desired by them.

Resource Creation

The growth of tourist facilities has not matched the fast rate of growth of the industry which is more than 15% to 20% per annum. One of the prominent issues requiring early decisions is how best to expand the infrastructure of bed capacity, transport services, guide services, winter sports, *shikar* and fishing facilities, air terminals, quick entry and exit formalities and baggage handling. This is today's task. But future decisions about investment and facilities planning are much more complex. Through the application of simulation techniques, capacities of present hotel accommodation, transit facilities, local transportation, origin and destination of

domestic and international tourists and duration of stay can be more effectively studied. The various factors affecting tourism can be identified and through mathematical modelling, alternative development plants with assessment of improvement benefits and accompanying costs can be assessed. Other countries have done it, we can also do so. But our capacities to create more resources immediately are no doubt limited.

We are short of accommodation in hotels, in places, trains, cars, buses and entertainment houses. The next decade will witness major social and technological changes at a much rapid rate in India and more so abroad. Certain trends are already discernible. In respect of tourism, substantial changes are noticeable not only in the structure of tourists but also in tastes, nature and type of services demanded. The physiognomy of the modern tourist portrays features much different from his counterpart in the past. While luxury tourism is growing at a slow rate, mass tourism is expanding very rapidly. The age of Jumbos is round the corner and we may be caught unprepared for an explosion of international tourism. India expects to receive over 400,000 tourists by 1973; an increase of over 33 per cent on the estimated arrivals in 1970. With such radical changes almost knocking at our doors, what are the prospects for India's accommodation trade likely to be?

The accommodation problems on the Indian Airlines are expected to ease after the introduction of their seven Boeing-737 by April 1971, which would *inter alia* enable them to carry more traffic not only to destinations already on the beaten track but to new areas on the air map of India. In addition, the expansion of facilities in the air transport can relieve the railways from costly operation of prestige travel facilities on certain important trains, namely first class air-conditioned accommodation.

The major bottleneck would continue to be in respect of hotel accommodation. To meet the requirements of 400,000 tourists by 1973, India needs an addition of 10,000

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DEPOSIT MOBILISATION BY COOPERATIVES:

AN ANALYSIS

Y. SESHAGIRI RAO

DURING the past few years agriculture in India has witnessed several major changes of great import. As a result, the production levels have gone up. The resulting prosperity means larger incomes to the rural population and a greater propensity to save as well as a boost to institutional deposits. An analysis of the performance of the cooperative institutions in deposit mobilisation is attempted here. The year 1965-66 is taken as the base year for this since the impact of Green Revolution could be expected to be felt from 1966-67 onwards.

The deposits of the State Cooperative Banks as well as the Central Cooperative Banks from 1965-66 to 1968-69 are shown in Table I.

The deposits of the State Cooperative Banks stood at Rs 146.51 crore at the end of 1965-66. They registered a marginal increase of 0.6% by the end of the next year. During 1967-68, however, the rate of increase of the deposits over the previous year was the highest at 21.9 per cent. At the end of 1968-69 the deposits touched Rs 215.63 crore marking 20% annual increase. It could be seen that the overall increase in deposits over the period 1965-66 to 1968-69 was around 47 per cent.

Similarly, the deposits with the Central Cooperative Banks went up by about the same extent during the same period. The deposits were Rs 236.59 crore at the end of 1965-66. During the next year they rose by 9.7% to touch the level of Rs 259.32 crore. The rate of annual increase in deposits was the highest during 1968-69 at 16.7% and the deposits were of the order of Rs 350.84 crore as against Rs 300.62 crore a year earlier. The average deposits per Central Cooperative Bank in the country worked out to Rs 102.89 lakh at the end of 1968-69 as against Rs 68.38 lakh at the end of 1965-66. A frequency distribution of Central

Cooperative Banks in terms of deposits reveals that the number of central banks having deposits above Rs 5 crore went up from 7 in 1966-67 to 9 during the next year and to 13 in 1968-69, while those having deposits below Rs 50 lakh came down from 215 in 1966-67 to 202 in 1967-68 and to 189 at the end of 1968-69.

Source-wise and type-wise classification of deposits of the State and Central Cooperative Banks is given in Table II.

The State Cooperative Banks accept deposits from individuals and other institutions in addition to the deposits of the affiliated cooperative banks. Such deposits from individuals and others rose from Rs 51.78 crore at the end of 1966-67 to Rs 70.99 crore at the end of 1968-69. As percentage of the total deposits, however, there was a decline in the share of deposits from individuals and others from 35.1% at the end of 1966-67 to 32.9% at the end of 1968-69. It could be seen that the fixed deposits of the State Cooperative Banks were more dominant relatively to the current or savings deposits. The fixed deposits formed 48.2% of the total deposits at the end of 1966-67, rose to 49.9% at the end of next year and to 55.1% of the total deposits at the end of 1968-69. In the case of current and savings deposits as percentage to total deposits a decline in the trend could be seen. The former dwindled from 37.8% at the end of 1966-67 to 33.5% at the end of 1968-69 and the latter from 9.7% at the end of 1966-67 to 8.6% at the end of 1968-69.

The deposits from individuals and others as distinct from the deposits made by the affiliated cooperative societies with the Central Cooperative Banks rose from Rs 143.84 crore forming 55.9% of the total deposits at the end of 1966-67 to Rs 203.34 crore forming 57.9% of the total deposits at the end of 1968-69. At the level of Central Cooperative Banks also, it could be seen that the fixed deposits marked a slight upward trend while current and saving deposits as percentage to total remained more or less stagnant. The

fixed deposits of the Central Cooperative Banks were placed at Rs 121.90 crore forming 34.7% of the total as at the end of 1968-69 as against Rs 85.38 crore forming 32.9% of the total at the end of 1966-67. During the same period the current deposits of the Central Cooperative Banks declined from 24.9% at the end of 1966-67 to 24% of the total deposits at the end of 1968-69.

It is indeed at the level of the primary agricultural credit societies that the full impact of the rural prosperity and the increase in the propensity to save of the rural population can be felt. It should, however, be borne in mind in this context that the primary agricultural credit societies are not the only agency in the rural sector for deposit mobilisation. There are the commercial banks also which are perhaps in a better position to attract deposits in view of the facilities, like withdrawal by cheque etc., which they can offer apart from the general public confidence they enjoy. The deposit insurance scheme also acts in their favour. Post offices and *Nidhis* and chit funds also are in the field and the latter in particular offer better terms in attracting the rural savings potential. There is also the general inhibiting factor, namely, the general preference of the rural population to hoard rather than to deposit their savings with the banking institutions.

The deposits of the primary agricultural credit societies and other related details from 1965-66 to 1968-69 are shown in Table III.

The deposits of the primary agricultural credit societies amounted to Rs 34.49 crore at the end of 1965-66. They recorded an increase of 13.3% during the next year and reached Rs 39.09 crore at the close of the year. The annual percentage of increase was the highest during the year 1967-68 at 20.7% and at the end of the year the deposits touched Rs 47.17 crore. These were placed at Rs 56.84 crore at the end of 1968-69. During the four years ending 1968-69 the index of deposits rose to 164.8 with 1965-66 as base, indicating an overall increase in

deposits during the period of a little over 64 per cent.

The average deposits per society in the country rose to Rs 3,388 in 1968-69 as against Rs 2,745 a year earlier and Rs 1,796 in 1965-66. From the picture of deposits obtaining at the end of 1968-69 Kerala seems to fare very well with average deposits per society working out to Rs 32,781. This, in a way, could be related to the size of the society in the State. In Kerala, the average membership per society is also the highest. The average deposits per society worked out to Rs 13,576 in Punjab, Rs 4,838 in Tamilnadu and

Rs 4,833 in Gujarat. The average deposits per society were the lowest in West Bengal at Rs 587 per society. In Jammu & Kashmir they amounted to Rs 921.

The average deposits per member rose from Rs 13.2 at the end of 1965-66 to Rs 19 at the end of 1968-69. The per member deposits were low in Jammu & Kashmir—Rs 4, West Bengal and Uttar Pradesh Rs 8 each and Rajasthan Rs 10. The prosperity in the countryside in Punjab seems to have been amply reflected in that the average deposits per member were the highest at Rs 102 as at the end of 1968-69 in that State.

Table 1

State Cooperative Banks			Central Cooperative Banks		
Deposits (Rs in crores)	Index	% increase over the previous year	Deposits (Rs in crores)	Index	% increase over the previous year
1965-66	146.51	100	236.59	100	—
1966-67	147.38	101	259.32	110	9.7
1967-68	179.60	123	300.63	127	15.9
1968-69	215.63	147	350.84	148	16.7

Table II

State Cooperative Banks					(Rs in crores)				
Source-wise classification of deposits					Type-wise classification of deposits				
Total	of this from individuals and others	2 as % of 1	Current	% of Total	Savings	% of Total	Fixed	% of Total	
1966-67	147.38	51.78	35.1	55.77	37.8	14.26	9.7	71.09	48.2
1967-68	179.60	57.69	32.1	65.68	36.7	15.87	8.8	89.62	49.9
1969-69	215.63	70.99	32.9	72.20	33.5	18.50	8.6	118.81	55.1

Central Cooperative Banks					(Rs in crores)				
Total	of this from individuals and others	2 as % of 1	Current	% of Total	Savings	% of Total	Fixed	% of Total	
1966-67	259.32	143.84	55.5	64.65	24.9	84.57	32.6	85.38	32.9
1967-68	300.62	172.58	57.4	73.38	24.4	100.15	33.3	100.37	33.4
1968-69	350.84	203.34	57.9	84.31	24.0	118.16	33.7	121.90	34.7

Table III

Deposits of Primary Agricultural Credit Societies				
Deposits (Rs in crores)	Index	Percentage increase over the previous year	Average deposits per society (Rupees)	Average deposits per member (Rupees)
1965-66	34.49	100	—	—
1966-67	39.09	113.3	1797	13.2
1967-68	47.17	136.8	2187	14.6
1968-69	56.84	164.8	2745	16.8
			3388	19.5

MINERAL DEPOSITS IN SOUTH-EASTERN REGION

The Geological Survey of India has conducted systematic investigations in the south-eastern region for the location of mineral deposits during the last three years. The region covers Andhra Pradesh, Orissa, south-eastern part of Madhya Pradesh, southern part of Bihar and south-western part of West Bengal.

As a result of these investigations, reserves of about 10.6 million tonnes of nickel ore in Sukinda area; 4.74 million tonnes of lead-zinc ore at Sargipalli in Orissa, 64 million tonnes of copper ore in Rakha mines-Roam-Sidheswar belt in Singhbhum district, Bihar, and 5 million tonnes in Nalakunda and Dukunda blocks in Agnigundala belt, Andhra Pradesh, have been established. Sizeable deposits of bauxite, limestone, dolomite, iron ore, coal in Madhya Pradesh; clays and coal in West Bengal; graphite, kyanite and coal in Bihar; lead ore, manganese ore and chromite in Orissa and coal, limestone and lead-zinc in Andhra Pradesh have also been located.

Besides, airborne geophysical surveys over selected areas of Andhra Pradesh and Bihar were also carried out. As a result of the ground evaluation carried out so far, a zone of copper mineralisation in Baharagora area in Singhbhum district of Bihar and mineralised section of lead and zinc in Venkatayapalem area of Andhra Pradesh have also come to light.

MORE PEOPLE ADOPT FAMILY PLANNING METHODS

An increase of 18.9 per cent was registered in the number of persons using family planning methods during 1970. The number rose to 34,10,580 upto January 1971 as against 28,67,268 during the corresponding period of last year.

During the same period 10.7 per cent of couples in the reproductive age-group were given protection. The method-wise break-up was: sterilisation 7.2 per cent, IUCD 1.5 per cent and conventional contraceptives 2 per cent.

THE PROBLEMS OF WORKING WOMEN

THE phrase "working women" is generally understood to mean women who take up jobs usually outside the home, the work being mostly of a remunerative nature. The term is, however, a misnomer insofar as it implies that the housewife is not a "working woman". It is indeed surprising that housewives all over the world have not unanimously taken umbrage at this phrase!

Problems of working women differ (a) according to their marital status, and (b) the different social levels in their society.

However, in most countries, especially India, women, irrespective of their status in society, are faced with a deep-rooted prejudice against devoting themselves to other than 'wifely' or 'womanly' duties. The prejudice stems from the age-old tradition which assumes a division of labour between a bread-winning husband and a domestic wife. The prejudice is born of the belief that a woman is not equipped to handle 'men's jobs' and that these are better left to men alone. There are two categories of working women. Those who must work to support themselves and their families, and those who choose to work.

In India, traditionally a large number of women in the poorer classes have worked as hard, if not harder, and as long, if not longer, outside the home as their menfolk. Whether as domestic hands, sweepers, road-builders or out in the fields, they have laboured to supplement the family income. Consequently, the prejudice against their working is much less than in the case of women who work by choice and not of necessity. It is with women of this category that we are primarily concerned.

The reasons that prompt a woman to start working—apart from economic necessity—are manifold. A woman may work to raise the standard of living of the household or to have an independent income which she can spend as she likes.

Also, she may work because she feels that she cannot do without the intellectual stimulus and the social contacts that she is deprived of if she confines herself to the home. She may feel that she owes it to herself no to "stagnate" at home but to utilise her education and her mental faculties. She may work because she finds time hanging heavily on her after the household chores have been taken care of, or just to escape from the drudgery of life. These are some of the reasons that motivate women to venture into what is still essentially a man's world, leaving behind them the security and inevitably—to a certain extent—the monotony of home.

ANUPA GUPTA

There does exist, however, a fairly wide range of traditionally feminine jobs, such as social work, nursing, teaching, cooking, designing, housekeeping and the like. A large number of women also take to secretarial work, perhaps because it is well paid and not too demanding by way of initiative or enterprise; and alternatively because psychologically they are attracted to a job which duplicates in a sense their function at the home, that is, looking after the interests of one man.

Newer avenues where women are beginning to make their presence felt include administration, architecture, medicine and small-scale commerce as beauticians and hairdressers, to mention only a few. There are indeed a few occupations that have remained solely the preserve of men.

This is no mean an achievement for women, especially in a country like ours, with its die-hard traditions, defining the role of the women as distinct from that of the men. But this has, however, brought in its wake certain difficulties which differ from class to class. It is mainly the conflict between the two worlds of the working woman which gives

rise to problems of economic, social and psychological nature. There are no easy solutions to these problems. Each woman has, according to her own circumstances, to work out for herself a balance between the warring demands of home and occupation.

Changing Conditions

Looking at the problems that confronted the unmarried working girl, belonging to an upper middle-class family, it would be seen that this position is fast changing. Till recently, a girl was married off as soon as, or even before, she had finished her education. Today, most young girls take up jobs after graduating, if for no better reason than to while away time till they are married.

A significant problem that confronts a young working girl is how to conduct herself in her relations with men, whether they be colleagues, seniors or friends. Then again, she has to reconcile the standards and values of her background to those of the new society. The longer she works, the more difficult it becomes for her to settle for a match arranged by her parents. Her growing independence, both financial as well as in thought and action rebels against this method of choosing a life-partner. She may continue to reject offer after offer, seeking the intellectual superiority, the urbanity and the charm she has come to associate with the successful man, without realising at the same time that these may not be qualities to live with and build a stable home upon.

A single girl, not living with her family, is beset by problems of another sort—economic in nature. She has to fend for herself, find suitable accommodation, whether in a hostel (of which there are still too few), as a paying guest with a family, or sharing rooms with friends who are in similar circumstances. The latter would mean setting up a house on a limited budget with all the

Before you have another child **think**

wouldn't you first
like to give this child
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COOPS IN MAHARASHTRA ENTER NEW VENTURES

From our Bombay Correspondent

AN 18-crore rupee project for setting up a huge Ployester Filament Yarn Plant is being taken up by the Deccan Cooperative Spinning Mills of Ichalkaranji (district Kolhapur) in collaboration with the State-owned Indian Petro-Chemical Corporation. Other mills from the cooperative sector to join hands with the "public sector in" this project are from Amritsar and Surat. Messrs Vickers Zimmer, Chemtex and Inventa have offered to provide the technical know-how.

The Centre has approved the construction of the plant.

Of the total capacity required for the plant, Rs 8 crore will be raised by loan from the Indian Finance Corporation and Rs 2 crore from the State Financial Corporation while the rest will be contributed by the Deccan Cooperative Spinning Mills.

KOLHAPUR IN THE LEAD

With a network of about 2,100 cooperatives of 22 different types and a total investment of over Rs 55 crore covering about 90 per cent of the population, Kolhapur district is in the vanguard of cooperative movement in Maharashtra. After meeting agricultural and other needs of about five and a half lakh members, all cooperatives in the district together made a profit of Rs 1.17 crore in the year ending June 1970. Kolhapur city with a majority of sugarcane growers' societies and Ichalkaranji town with most of the weavers' societies, together contributed about Rs 35 crore of the capital.

The participating cooperative mills would be getting polyester yarn quota in proportion to their investments under the agreement with the IPCC which is to be signed within two or three months' period. The main raw material (DMT) is being produced by the IPCC which could also use the by-product methanol.

NYLON PLANT

Yet another venture in the offing in the cooperative sector is a Rs 12 crore nylon plant with a rated capacity of 6 metric tonnes of yarn per day. It is proposed to be set up either at Roha in Kolaba district or Chiplun in Ratnagiri district.

A NEW VASECTOMY RECORD

Over 50,000 vasectomy operations were performed in Maharashtra during the month of January this year. This figure touched a new high for any single month since the family planning programme began in the State.

Among all the districts, Chandrapur with 7,658 operations to its credit during the month, topped the list.

At a family planning camp in Malhar Peth in Satara district, 437 operations were performed in a single day. This is a new all-India record, exceeding the previous record of 434 such operations done in Kerala.

PRE-SCHOOL CHILD CARE

In cooperation with private social welfare associations, the Regional Social Welfare authorities propose to add 100 more centres to the existing ones for providing nutritious food to children in slum areas of Greater Bombay. Each such centre will cover about 200 children between 1 to 3 year age group. Under the programme children upto the age of one year are given 200 ml of milk per head and those between 1 and 3 years get 100 ml of milk and three slices of Modern bread each. The scheme which was initiated in September last, now caters to over 11,000 children.

TRAINING IN SMALL INDUSTRIES TO YOUTH

The Dhulia Zila Parishad has formulated a scheme for imparting training to young men in small industries. Under the scheme, young men who have passed the 9th standard will be given training for three months. During this period each trainee will be paid a monthly stipend of Rs 40. After completion of training they will be supplied with necessary tools by the State Government. It is proposed to start three centres in the district, one each Dhulia, Shahade and Nandurbar.

IN the early sixties, eight farms were set up in different parts of the country to demonstrate improved rice growing techniques and impart field training in such methods to Indian farmers. These were located at Nadia in West Bengal, Sambalpur in Orissa, Shahabad in Bihar, Surat in Gujarat, Bapatla in Andhra Pradesh, Chengamanad in Kerala, Mandya in Mysore and Khopoli in Maharashtra. During this period 32 Japanese experts, four at each farm, helped to train Indian farmers. Japan also provided Rs 19.1 lakh worth of machinery, equipment, tools, spare parts and other material required for setting up and equipping the farms.

With the view to extending the area of economic and technical cooperation between the two countries, the four farms at Shahabad, Surat, Mandya and Khopoli were converted into agricultural extension centres.

INDO-JAPANESE COOPERATION IN AGRICULTURE

Under the agreement signed for the purpose the team of experts assigned to each centre comprised a chief adviser, an agronomist, an agricultural machinery specialist and a soil and fertiliser specialist. Japan has till the end of last year provided Rs 23.2 lakh for machinery and equipment required for the implementation of the centres' programmes.



The use of a binder being demonstrated at the Mandya Centre.



A sampling operation in progress in a farm under the supervision of Japanese experts.

In August last the two countries, under another agreement, initiated an agricultural development project in the Paralkote Zone of Dandakaranya. The project aims at covering the entire socio-economic situation in the zone through the development of agriculture. The Japanese Overseas Cooperation Volunteers (JOCV) has sent 65 volunteers to work in the field of agriculture, health and sanitation, telecommunication, education and sports. Of these 52 are in the field of agriculture in various States.

About 40 volunteers sent by the Organisation for Industrial, Spiritual and Cultural Advancement, a voluntary agency of Japan, are already working in the field of agriculture, mainly at the State farms in Punjab, Uttar Pradesh, Haryana, Gujarat, Jammu and Kashmir, and Himachal Pradesh. They are helping to raise agricultural output, especially rice production.

Western Express Highway Project

The Central Housing and Urban Development Finance Corporation has agreed to provide loan assistance up to Rs 5 crore for the Maharashtra Government's Western Express Highway Project in Bombay. The Corporation has also agreed to make Rs 25 lakh immediately available for this purpose.

The Western Express Highway Project in Bombay envisages acquisition and development of 256 acres of land along the Western Express Highway from Mahim causeway to Santa Chruz aerodrome and utilisation of cleared site, partly for commercial purpose and partly for constitution of about 24,000 tenements for slum dwellers and weaker sections and dormitories with 9,240 beds for pavement dwellers.

The Rs 30-crore project is expected to generate total investment of Rs 29.56 crore over 10 years. The estimated gross return will be about Rs 33.60 crore.



Crops growing on a strip of land which was once barren because of high salinity.

FARMING IN AFFECTED SOILS

M. L. BHATIA

EVEN at a rough estimate, more than 70,00,000 hectares of land in India is unproductive due to soil salinity and alkalinity. In a comparatively small state like Haryana, an estimated 500,000 hectares is affected by salinity. It is ironical that Karnal, Rohtak and Hansi, which are the most productive areas, are the worst affected. As more canals are dug to raise food output from the cultivated areas, the problem of soil salinity continues to haunt the planners.

In order to tackle this problem and to increase agricultural output in the State, a Central Soil Salinity Research Institute has been set up at Karnal to desalinate affected areas and to conduct research on the physico-chemical characteristics of the soil. Its other functions include devising methods for leaching different types of salts, undertaking drainage investigations and evolving varieties of crops suitable for the affected soils.

The Institute has acquired a strip of 40.4 hectares of land, which,

once barren because of high salinity, is now a green belt where rice and sugarcane are growing in splendour. Nothing had grown on this hostile land for the last 80 years. When men from the Institute first appeared on the strip to reclaim it the neighbouring farmers ridiculed the attempt. Undaunted, however, the agro-scientists started treating the land with measured doses of gypsum, regulated irrigation and plantation of selected crops. Soon neighbouring farmers started coming to see the miracle which these scientists had performed on a barren piece of land. This kindled in them a new hope of recovery for their forsaken lands.

Asked why the selection for the location of the Institute fell upon Karnal, Dr Bhumbla, the Director of the Institute said, "We were keen to work in an area which had been ravaged by soil salinity and alkalinity so that our research could be function-oriented. Fortunately such a strip of land was available with a sister Institute, namely, the National Dairy and Research Institute, Karnal."

Research work in the Institute is conducted through three main divisions, namely, Division of Soils and Agronomy, Division of Agricultural Engineering and Division of Genetics and Plant Physiology.

Preliminary experiments of the Institute, in the area, have shown that the addition of gypsum greatly helps the growth of plants. Jowar and Sudan grass can be grown under such adverse soil conditions. Paddy variety Jhona 349 has also been found to be suitable for these areas.

These encouraging results, obtained in such a short period, have not only filled the hearts of the young scientists with pride, but has opened a new vista for the application of science.

Regional Research Stations have been established at Kanpur in Uttar Pradesh, Indore in Madhya Pradesh and at Canning in West Bengal to conduct a study of alluvial black and coastal regions of the country.

SWEET MENACE TO HEART

A diet rich in sugar can cause the quantity of triglyceride in the blood to rise appreciably, thereby increasing the risk of arteriosclerosis, reports a Swedish research team.

While extra sugar was found to have no noticeable effect on hens and dogs, a diet containing 50 per cent sugar caused an appreciable rise in the fat content of rabbits' blood, the team reports. It was also established that a normal hospital diet given to men volunteers, and supplemented with 500 grammes of sugar daily, produced a "pronounced increase" in the triglyceride present in their blood.

Cholesterol and triglyceride, the two principal fatty constituents in blood, can lead, when present in large quantities, to arteriosclerosis.

World's Biggest Milk Drive:

"OPERATION FLOOD"

At the Eighth Congress of the Indian Dairy Science Association held recently in Trivandrum, a very important scheme of the Government of India to 'flood' the villages with milk was made public. Here are a few salient features of the scheme as given by Dr V. Kurien.

Dr V. KURIEN

INDIA's primary or the commanding milk markets are in the four big cities of the country, namely Delhi, Calcutta, Madras and Bombay. They consume the largest quantity of liquid milk and milk products. If some order is to be brought in the country's milk distribution, it is the markets in these large cities that have to be controlled.

Bombay's total milk consumption is one million litres. The Aarey Milk Scheme produces four lakh litres and sells at Rs 1.70 per litre. There are 100,000 heads of cattle (buffaloes) in the city's suburbs. They produce six lakh litres. The milk produced by individual cattle farmers, which is of a quality commensurate with that of Aarey (that is, containing 7 per cent fat) is sold at Rs 2.50 per litre. During festive seasons, the price usually goes up to Rs 3 or Rs 3.25.

The one lakh buffaloes and their calves, brought into the city by individual farmers from rural areas, were the finest and most economic in the region. Their fodder and feed was also brought from outside. Besides high rate of mortality amongst the calves, the buffaloes became dry

in eight months. They would have to wait for another ten months after they met the bull. Half of them were taken to the villages for mating. The other half were killed in the slaughter house. These figures might not be quite accurate; yet they reveal the difficult position.

The picture is not very different in regard to Calcutta. The only main difference is that in Calcutta, instead of buffaloes, they have cows. They get the finest of cows from Punjab, the Tharparkar cows. Again there arises the same situation as in Bombay. But according to a Supreme Court decision, useful cows cannot be killed. So in order to make them 'useless', their legs are broken. Thus we specialise in destroying the most useful and not the useless.

It was under these circumstances that the National Dairy Board thought of a solution. In most of the advanced countries, cities get their milk from rural areas. They keep their cattle in the rural hinterland. New York City receives several train loads of milk from 1,200 kms. or so away. Bringing cattle all the way from rural areas to the city is like bringing milk on four legs. This is a wasteful way. By retaining milk production in the rural areas, there would be a tremendous boost to the rural economy.

We had this technology in Aarey for the last 25 years. Aarey Milk Colony gave prestige or glamour to the organised dairy industry. It was the beginning of modernised dairy technology in India. So, when the National Dairy Board thought of a solution for the country's milk distribution problem, Aarey suggested itself. The Board felt that it was essentially a milk marketing problem. It is neither legal

nor administrative. So if we evolve a marketing solution, we get the answer. Gujarat and Punjab evolved certain legal and administrative solutions but failed.

The Aarey Milk Colony at present gets 100,000 litres of milk for distribution from Anand in Gujarat. With that, the total quantity of milk available with Aarey is 4 lakh litres. Suppose the milk brought from Anand is increased to 2 lakhs, then Aarey would have 5 lakh litres of milk. That is to say, Aarey would have 50 per cent of the Bombay market in its hands. As a result, the trade of cattle coming into the city would get a "shock". Today, apart from giving one lakh litres to Aarey, Anand distributes 30,000 litres within the town itself. If Anand gives 2 lakh to Aarey, it would have to collect an additional one lakh litres which means an additional production of one lakh in and around Anand. In this manner, by capturing the market in Bombay we can prevent lakhs of cattle coming into Bombay and occupying the scarce space that can be used for human habitation and creating all the consequent ills and also stop the destruction of the finest breed of buffaloes. In the process, the rural areas that supply milk would also gain economically.

This is the basis of the National Dairy Board's scheme called *Operation Flood*. The idea is to capture "the commanding heights".

FAO Assistance

Initially the World Food Programme of the FAO will supply 42,000 tonnes of butter oil and 1,420,000 tonnes of milk powder. These will be converted into milk and sold in

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A CRITICAL EVALUATION

MANPOWER POLICY AND PLANNING

S. SUNDARAM

IN the past two decades, considerable economic development has taken place in India. Better seeds, fertilisers and farm management have modernised our agriculture. The concept of Panchayati Raj and decentralised democratic socialism has given new values for a reorganised and dedicated administration. New sociological concepts have improved the social services not only quantitatively but also qualitatively.

In this context, manpower studies were made between 1950 and 1962 by the Scientific Manpower Committee, the Engineering Personnel Committee, the Perspective Division of the Planning Commission, the Working Group on Technical Education and Vocational Training and the Mudaliar Committee on Managerial Personnel in India. The Scientific Manpower Committee tried to forecast the different grades and number of scientists and technologists required till 1960. It classified the national activities needing scientists and technicians. Twenty main industries were studied to correlate the scientific and technical employment pattern and production to reach a production-personnel ratio to estimate the industrial manpower needs. Where the ratio was unknown, the estimates were based on the industry's size, its technical operations and similarities to identical industries abroad. For the Government Departments the projections were from their own data.

The Engineering Personnel Committee (1956) assessed the demand and supply of engineers and technicians during the Second Plan. The total public sector was divided into two groups. Only the output of the first was quantified. Data were collected from the questionnaire sent to the Centre, States and employers. The production-personnel ratio of the first group projects was applied to the Second Plan production targets. The engineering per-

sonnel for the second group of roads, buildings, etc. were estimated from the cost-personnel ratio of the estimated Second Plan project expenditure.

The engineering personnel for the Second Plan projects were also studied by the Planning Commission's Perspective Planning Cell. It assumed that the increasing demand for engineers was directly proportionate to an increased industrial output. A 1:1 ratio of relationship was taken. The manufacturing industries were classified into 9 groups with the estimated production targets. Taking the base 100 for the 1955-56 levels, the physical production index was calculated for each industry. The additional hands for the subsequent years were computed as a product of those actually employed in 1954 and the projected increased production in the Second Plan. The second study concerned the engineering personnel needs of the electrical undertakings, based on the installed capacity and type of generation.

Subsequently, the Working Group on Technical Education and Vocational Training estimated the Third Plan needs. They followed and applied the investment-personnel ratio and the production-personnel ratio to the respective targets. For the Fourth Plan, the Group assessed the engineering personnel needs by correlating their employment to those totally employed in the non-farm sector. The ratios for the first year of each of the four Plans (50-51, 55-56, 60-61, 65-66 and 70-71) were taken as 0.12, 0.16, 0.24, 0.41 and 0.55.

The Mudaliar Committee of the All India Council for Technical Education assessed the Third Plan managerial needs. Based on the data obtained through questionnaires, the relationship between total employment and production was estimated. The managerial manpower currently working and the total employment/production investment were correlated.

The managerial needs of manufacturing industries, banking, trade and commerce, construction, and transport and communications were also worked out. The Committee also classified the managers as technical, commercial and general, including technical supervision. Based on the report, the Institute of Applied Manpower Research studied the job outlook for the managerial personnel for 1961-76.

Most of the reports so far have concerned themselves with forecasting India's Engineering, Scientific and Managerial manpower needs only. That too was in too general a way within the scope of the Five Year Plans. There had been little regional or organisational micro-level studies. For a sub-continent like India with widely varying demographic, educational, cultural and employment patterns, the regional studies are more relevant than the general essays at the national level. As the sociological and motivational attitudes differ from place to place in our country, there is a rational basis for Statewise manpower studies for proper economic development.

Micro-economic industrial studies are useful for a detailed classification of firms within an industry and also to know the levels and nature of skills for further development. Educational policies and plans could be organised meaningfully based on the regional and micro-organisational project work. Moreover, it can evaluate precisely the correlation between the different categories of personnel and output/investment, etc. depending on differing unit size, production method, technological pattern, managerial productivity, capacity utilisation and so on among firms within an industry.

Need for Improvement

But all the earlier reports relied mostly on the available statistical information without any actual field

work. The projections were on the assumed relationship between the aggregate investment or employment or production and the demand for specified types of personnel. In the study of engineering manpower, productivity, classification of industries and skills were overlooked. The concepts and norms used by all the Committees needed refinement. The sources of the manpower information system and statistical data on education, employment and demographic patterns required to be improved.

The basis of the Indian manpower studies done so far has been the ratio of investment/cost, production/personnel, total employment/turnover and managerial employment/total employment. Even within the same industry they differ. The size, investment base, technology, capacity utilisation, managerial efficiency product and production techniques and organisation structure differ. So a general forecast even for similar industrial units could be misleading. Moreover, the current employment standards reflect merely the standards of the scarcity supply and not the normal demand.

Changing productivity and improved technologies due to research, development and investment have been overlooked while forecasting our engineering manpower. They reduce the manpower demand. Automation and improved techniques may totally alter the need for human effort. Therefore their influence should be gauged for improving the accuracy of the projections. The qualitative definition of the managerial and engineering manpower has also not been indicated in the reports. Consequently, it is difficult to arrive at any prevailing or predictable figure of shortage or surplus over a period. The choice of the optimum time horizon was rather loose in all the studies made so far. Inaccuracies can snowball during long extrapolation periods. But for educational planning and training for specialised skills and professions, a long-term forecast may be better.

Built-in Flexibility

Priority should be given to the study of problems having direct bearing on the existing economic conditions. If and when changes occur, the study should have a built-in flexibility related to realities.

Moreover, employment policies and economic projections should also be considered at each stage for revamping the empirical assumptions. Regional Manpower Policy and Planning Boards for evaluating the demand in the different economic sectors will be a good beginning. Similar Boards should be organised for each of the major industries like steel, fertilisers, heavy chemicals and so on. Their primary task should be to standardise and define the variables likely to influence the demand projections. The Boards could also give the guidelines for improving the source of statistical data and the methods for their collection. The aim should be to get as much true figures as possible. So the studies so far are merely 'guesstimates' and not proper scientific estimates. There should be a more standardised system of skill classification in India. For organising the suitable level and type of education, the present skill indicators are inadequate and misleading.

Proper manpower planning needs a perfect labour market knowledge. A study of the work attitudes, job needs and labour mobility will improve the manpower and employment services.

Manpower is related to the cultural, religious and social structure of a country. We are and will be for a long time to come, a multi-cultural nation having minorities and religious groups. Our greatest problems are the vast land area and the enormous population. We are a very low income country where the State objectives point towards a welfare society seeking economic and social justice and equity for all. Manpower policy is a function of national and personal objectives, rooted in the basic popular values and aspirations. It depends on the kind of life we want for ourselves and our children. Only when we are clear about them can our manpower policies be realistically related to our high-priority objectives.

TO KNOW INDIA READ YOJANA

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OPERATION FLOOD

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the main cities of the country. The profit of 55 million dollars that the National Dairy Board will make will be used to build a National Milk Grid which will include the dairy projects in the four cities and 17 dairies in ten States which form the rural hinterland of the cities. It will be possible to switch milk from one point to another without difficulty. These will be set up in cooperation with the State Governments.

An amount of Rs 30-35 crore will be set apart for the Grid. Animal husbandry development will get Rs 45 crore. A sum of Rs 4 crore will be allocated for research. There will be exotic semen banks for which purpose imported cattle of the finest stock are beginning to arrive. Under the scheme, cooperatives and extension work will be organised on a very large scale.

The scheme was started on July 17, 1970. No larger dairy scheme has been attempted anywhere in the world. And this will be the beginning of a bigger dairy programme. Milk distribution under the scheme will have certain novel features. A new form of packaging milk will be introduced. Milk will be packed and distributed in plastic pouches or sacks. Milk that can be kept without refrigeration for a week will be packed in aseptic paper packages with plastic lining and sold in ordinary shops. One million such packages will be released soon for sale. Those who do not want to get their milk daily or do not want to go out for shopping for a week can make use of this facility. The concept of no packaging also will be tried. Instead of supplying bottled milk as at present, (each bottle costs 23 paise), milk will be supplied in bulk and consumers can get milk as if by opening a tap.

RAJASTHAN TRIBALS' CREDIT NEEDS

ROOP SINGH

ALTHOUGH no systematic survey of credit needs of the tribal population of Rajasthan has been carried out, it has been possible to estimate their credit requirements through various studies on indebtedness conducted from time to time by several agencies.

According to the 1961 Census, six tribes—the Bhils, Bhil-Minas, Minas, Damores, Garasias and Sehriyas—were registered in Rajasthan and they together numbered 2,309,447. Of them 22,62,207 were workers and 9,96,098 non-workers.

Out of the 19 tehsils of the five tribal majority districts of the State, 16 are located in Udaipur, Dungarpur and Banswara districts where mostly Bhils reside. Minas reside in the Pratapgarh tehsil of Chittorgarh and Sehriyas in the Shahbad and Kishangarh tehsils of Kota. The mainstay of tribal economy in these areas is agriculture, the present land holding being inadequate and of poor quality. The result is low productivity. It is, therefore, apparent that most of the tribal families need loans to make both ends meet.

Assuming that almost the same number of families as were in debt in the past shall also need loans in the future, nearly 15,565 i.e. 94 per cent of families in 295 villages spread out in two tehsils of Kota district, would require loans from the nationalised banks. In eight tehsils of Udaipur district, covering 1,590 villages, 77,629 families would need loan facilities. In the districts of Dungarpur and Banswara and in Pratapgarh tehsil of Chittorgarh district which together constitute the Scheduled Areas of the State, 96,219 families would need financial assistance from the banks, which will have to operate in the interior and cover a large population.

As suggested by the study team on tribal development programmes, there are two approaches to tackle the problem of disbursement of credits. The first alternative is to make an intensive effort in restricted areas where the entire credit require-

ment of the tribals may be met by selective use of the credit facilities. The second is to go tehsil by tehsil in a predetermined order to effect intensive utilization of the credit facilities.

Old and New Debts

Some of the surveys reveal that old and current debts respectively contribute 29 and 71 per cent of the total. On this basis, it is estimated that total current and old debts would be of the order of Rs 16,944,751 and Rs 41,485,426 respectively. These surveys further reveal that between 4 to 40 per cent of the current debts have been contracted for production purposes.

It has been estimated that the total requirement for productive purposes would be Rs 12,667,652, as against Rs 28,817,774 for unproductive needs. In case of loans for unproductive and social purposes, it must be mentioned that except for the purposes of foodgrains and certain ceremonial occasions, every family will not be in need of a loan. It can be assumed that around 20 per cent of the families would require credit for purely social purposes like marriage and death. However credits required for foodgrains and festivals would constitute about 24 per cent of all advances. Eighteen per cent of the unproductive loans would be required for miscellaneous purposes.

NEW INDUSTRIAL UNITS FOR UNDER-DEVELOPED AREAS

From Our Bombay Correspondent

THERE has been a concentration of industries in and around Bombay. Nearly half of the industrial units in Maharashtra are housed in Greater Bombay, creating an imbalance in the State's development. A vigorous effort is now being made to disperse the new units to under-developed areas so that industrial expansion can also ensure local employment growth. Various incentives have been offered to industries which may be located outside the Bombay-Poona-Khopoli region. The programme of industrial estates is designed mainly to bring about this dispersal of industries.

A modest beginning with 10 estates was made in the Second Plan. The number rose to 69 at the end of the Third Plan. Of these 58 are on cooperative basis, 6 on government account, two under municipal authorities and the remaining three will be functional estates to be set up by the Maharashtra Industrial Development Corporation.

A common facility centre for repairs and maintenance is an added attraction of the scheme. Such

centres are being established at Sholapur, Nanded, Karad, Ratnagiri and Aurangabad. One at Sangli has already started functioning. During the Fourth Plan such centres are proposed to be set up at Jalna, Chiplun and Ichalkaranji.

The three functional estates are to be located at Marol, in Greater Bombay, for automobile ancillaries; Bhosar, near Poona, for electronic and electrical industries; and Kamptee, near Nagpur, for light engineering industries.

At present 34 estates are functioning and another 34 have been constructed. In addition to 1,440 sheds already built, 2,385 are under construction. The estates which are in operation employ 15,402 workers and their annual production aggregates to Rs 2,685.44 lakh. The cost of setting up these estates has been estimated at Rs 472.90 lakh.

In addition, private parties have constructed multi-storeyed buildings or sheds and sold the space on ownership basis, and have thus helped many an industrialist to set up units even in big cities.

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DEPOSIT MOBILISATION

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and television, personal soliciting of accounts, new and improved services such as introduction of soft music in the banks and offer of small interesting gifts to new account openers, undertaking of payroll functions on behalf of different types of establishments and introduction of lock boxes.

The introduction of lock boxes is especially a novel idea which effectively checks cash drain from the bank. If deposits cannot be mobilised as fast as loans are made out, it is absolutely necessary to stop the cash drain in order to maintain the right credit-deposit ratio. Recently the Governor of the Reserve Bank has also urged the banks in India to rely more on bills of exchanges and minimise their cash transactions. In America, retail customers of large companies send their bills to lock boxes. Most gasoline companies have credit cards. The customers credit to the lock box; banks open the remittances and deposit them into the companies' accounts and forward the notices of payment to the customers. It obviously speeds up the receipt of funds and to the same extent decreases their need to borrow money for working capital. Though it is somewhat costlier to the banks it serves as an inducement to gain more and more depositors. The large Government, semi-Government and private companies in India can afford to carry out such an experiment.

The National Institute of Bank Management had also come out with a number of recommendations for stepping up deposit mobilisation on a nation-wide scale in their workshops conducted last year. The following are some of the recommendations:

- (1) The introduction of pigmy accounts from 10 paise daily onwards in a door-to-door campaign.
- (2) The opening of deposit accounts with a lottery coupon attached to it to catch the fancy of our lottery minded public.
- (3) Issuing of negotiable certificates for fixed deposits which can be conveniently lodged with the banks

for raising a temporary loan as and when the need arises.

(4) Offering discriminatory rates of interests on deposits. There is no gainsaying the fact that interest rates on small savings which can be collected from a large number of people must be stepped up significantly just to bring them in line with the rates paid outside the banks.

(5) Appointing travelling agents or starting mobile banks for a group of villages, taking regular rounds within a given radius and visiting nearby villages on an appointed day and time with unfailing regularity to inspire the confidence of our village folk. It can work wonders.

(6) Introduction of teller system to facilitate the banking functions.

The banking habit is proverbially called a plant of slow growth. If nurtured and nursed properly, it can bloom and bear fruits profusely.

PROBLEMS OF WORKING WOMEN

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worries that such an undertaking involves and without the security afforded by having a man in the house.

The problems faced by a married working woman, however, result mostly from her inability to do justice to her twin roles—that of the home-maker and that of the bread-winner, one likely to suffer at the expense of the other. In most cases, however, it is at home that the problems arise.

The woman who is financially independent may arouse unconscious resentment in her husband, who feels that his position as head of the house is being threatened. To suppress this feeling, he may become domineering and tyrannical, which the woman, in her turn, will try to resist.

Where the children of working mothers are concerned, one fact

that cannot be too strongly emphasised is "the attitude and personality of the mother rather than the amount of time she spends with her children, which is the all-important factor."

The two grave psychological risks which young children normally run are those of "rejection" and "over-protection". "The risk does exist though the working mothers owing to overwork, tiredness, worries or ambition may more often cause their children to feel wilfully neglected, than women who are about the house all day long". However, at the other end of the scale is another risk, that of over-protection. Mothers staying at home run greater risk in this regard, especially if they have come to feel that the children are the "meaning of their life".

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AGRICULTURAL BREAKTHROUGH

IN ASSAM

K. C. MAHANTA

ASSAM is primarily an agricultural State, though only one-third of its area of 3 million acres is cropped. The State consists of hills and plains covering varying agroclimatic regions.

In accordance with national plan, the plan-programme of the State provides for about 5 per cent per annum rise in agricultural production. In 1966-67 the total food production was 18.11 lakh tonnes which had increased to an estimated amount of 22.98 lakh tonnes during 1968-69. This was an all-time record of food production in the State and was achieved mainly through the introduction of high yielding paddy varieties—Taichung Native I, IR-8 and a locally developed strain, Monohar Sali. There are 54 Intensive Agriculture Blocks which have helped in increasing the rice production in recent years. However, due to recurring floods during 1969-70 the total production of foodgrains fell down to 19.62 lakh tonnes.

Wheat Takes a Foothold

The total area under high yielding paddy during 1968-69 was 2.50 lakh acres and in the current year 3.50 lakh acres are expected to be brought under high-yielding varieties. This figure might appear to be rather small but it may be noted that in 1966-67 the area under high yielding paddy was only 9,000 acres. Wheat was a minor crop in this State till recently. But with the introduction of Mexican varieties, wheat has got a foothold on the soil of Assam and, from a meagre 300 acres in 1966-67, these varieties now occupy more than 40,000 acres besides a large area under the traditional wheat varieties. In the next few years, wheat may well emerge as a major Rabi crop in all areas with irrigation facilities, covering as many as two lakh acres under Mexican wheat.

Jute is the major commercial crop in the plains of the State. In 1968-69 an estimated three lakh acres were under jute cultivation. Attempts are being made to arrest the decline of the total yield by increasing per acre yield through

improved method of cultivation and the introduction of a high yielding variety, called JRO 878. The target of jute production of 11 lakh bales during 1969-70 has been exceeded even during 1968-69 with a record production of 11.6 lakh bales. The increase is mainly due to the introduction of improved practices and also the foliar spray of urea and intensification of jute programme in 14 Jute Package Blocks.

Supply of Inputs

The use of fertilisers is also gradually increasing. The present consumption being 40,000 tonnes per annum. The recent price rise, however, is a setback to increasing the use of fertilisers. Soil testing has also been given due importance in the State in recent past. At present there are three soil testing laboratories in Assam with a capacity of 30,000 samples per annum. Two mobile soil testing laboratories are also to be introduced.

The Assamese farmer has now become actively conscious of scientific methods of cultivation. The agricultural extension services are capable of taking up extension work in remote rural areas. The small farmers are ready to take up plant protection measures against epidemics. During 1968-69, five lakh acres were under plant protection measures. In the current year, more than seven lakh acres will be covered by plant protection. The Agro-Industries Development Corporation is fully capable of handling the supply of pesticides in the State.

In regard to irrigation, besides minor irrigation programmes, a number of medium irrigation projects to cover more than 25,000 acres have been taken up. Lift irrigation with electricity is also working in two Blocks covering about 4,000 acres. Some more hydroelectric projects

are in hand. The Jamuna irrigation project, designed, to irrigate about 80,000 acres, has already covered 40,000 acres. The total additional area proposed to be covered during the Fourth Five Year Plan is 2.4 lakh acres. About 3,000 power pumps are also in use throughout the State to help small farmers in irrigating individual plots.

The Seed Act has already been enforced with reference to paddy, wheat and maize to secure quality seed production. The Seed Testing Laboratory at Gauhati is geared up to handle the seed samples for the purpose.

Due importance has also been given to increase the output of pulses and oilseeds in which the State is chronically deficit. New varieties are under trial at the research stations.

Horticulture

Much emphasis has also been placed on the development of horticultural crops. Use of fertilisers, pesticides, improved plant materials etc. has been popularised through various demonstration programme.

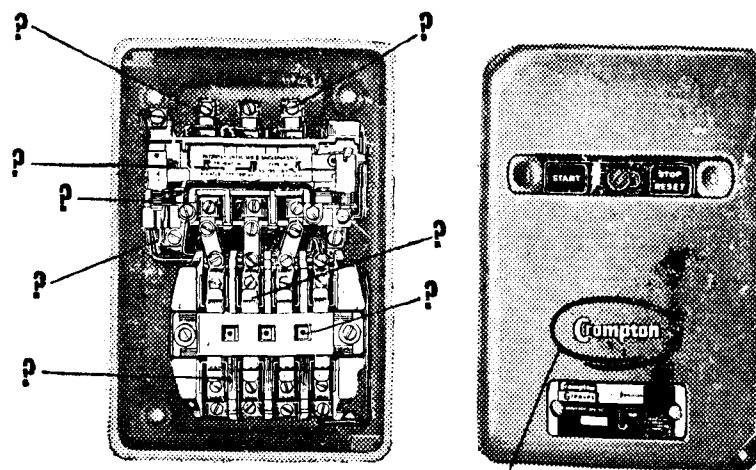
Areca nut, one of the important horticultural crops, stands second in acreage (65,000 acres approximately). Coconut is also a developing plantation crop. Special schemes for the development of coconut are now being taken up. A research station is working under ICAR at Kahikuchi (near Gauhati) which deals with problems of areca nut and coconut cultivation.

Citrus, occupying about 40,000 acres, has been a major commercial crop of the State. But unfortunately this crop is dwindling fast due to virus diseases. It has been identified that the oranges in Assam are affected by a virus disease called 'Greening Virus' or 'Die-back disease'. At Citrus Research Centre, Burnihat, and at Kahikuchi, research is underway to tackle this problem.

Potato is another important commercial crop in the Hills region, covering about one lakh acres. A potato research station, under

Turn to PAGE 38

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the most
important
part
of a
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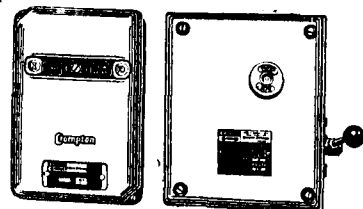
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Pusa Bedana watermelon.

GROWING QUALITY MELONS

DURGAPUR Madhu of Rajasthan, Lucknow **Safeda** and **Batheesa** of Uttar Pradesh, **Kutana** of Haryana and the Punjab, **Anar** of Andhra Pradesh, are some of the traditional and popular muskmelon varieties being grown in India, but none of them have all the qualities demanded by the consumer. While varieties are large, most of them are susceptible to pests and diseases. The scientists of the Vegetable Crops and Floriculture Division of the Indian Agricultural Research Institute, New Delhi, have succeeded in remedying this problem.

Pusa Sharbati is one of the results. It is a cross between a purified line of **Kutana** and an American variety, **Cantaloupe Resistant**. It combines the qualities of both, such as sweetness, thin rinds and small seed cavity. The fruits can stand transportation and are also resistant to powdery mildew disease.

Where watermelon is concerned, smaller or medium sized fruits weighing about 5 to 6 kg. are ideal for an average family. Very big fruits, weighing about 20 to 30 kg., are not commonly preferred and have to be sold as cut pieces. And a watermelon should, above all, be sweet and possess an attractive flesh colour. **Sugar Baby**, an introduction from U.S.A., commends itself for these qualities. The fruit is round, bluish green, and weighs about 5 kg. It has done uniformly well and the average yield is 3 or 4 fruits per plant.

For the connoisseur, the scientists of I.A.R.I., offer a seedless, high-yielding watermelon called **Pusa Bedana**. The fruits are bright pink and sweet. Since this is a hybrid, the seeds have to be carefully extracted and germinated, and along with the seed some pollinators (any common variety), too, have to be sown

Pusa Sharbati muskmelon ready for harvesting.



for providing pollination and fruit-set.

Melon-cultivation need not be confined to riverbeds, as is the practice in India. It can be extended to cropped land in rotation with other field crops.

Here are a few tips to melon growers,—to get a higher income from quality fruits:

Where winter is severe, as in the North, only one crop (Nov.—May) of melons is to be taken. But where winter is not severe, as in the South, two crops can be taken, one in November—February and the other in March—June.

Sowing in the cultivated lands of North India should be completed before the middle of February,—may be after the harvest of potato or any such crop.

Apply 40 to 50 cartloads of farm-yard manure or any other well decomposed organic manure and 18 kg. P_2O_5 per hectare to the soil in the channels or pits and mix them well with the soil before sowing.

Sow the seed either in the channels or pits at the rate of 2.0 to 3.00 kg. of seed per hectare depending on the variety and size of the seed.

Top-dress with 35 to 45 kg. of nitrogen and 25 kg. of potash per hectare 15 days after germination. Repeat the same dose 20 days thereafter.

Control the red pumpkin beetles which attack young melon plants (just after germination) by dusting 2.5 per cent BHC and Lindane.

Watch for aphids in February and March. Spray Metasystox or Malathion (about 13 to 17 c.c. in 10 litres). Spray or dust 0.2 per cent Morestan or Thiram or 2.25 per cent Zineb. Karathane at 30 to 50 kg. per hectare at the time of flowering and fruiting prevents the spreading of powdery mildew disease.

Remove regularly the fruits suspected of fruitfly damage. Pick only well-matured fruits as immature fruits fetch less money. If they have to be transported long distances, better pick the fruits a couple of days in advance.

BALANCE AND CONSISTENCY IN PLAN ESTIMATES

from Page 6

relevant input coefficients as well as the import coefficients. The total of sectorwise imports obtained in this way should not exceed the sum total of exports and the expected level of foreign loans and aids. Care should also be taken to see that foreign supply of each item of import will be available.

Material Balance

Owing to paucity of data and computational limitation, the input-output analysis cannot always be undertaken with the necessary details of the many different sectors useful for planning purposes. Therefore, the input-output analysis with a limited number of aggregated sectors has to be supplemented by other analytical tools like analysis of material balances in order to have information on disaggregated sectors wherever necessary.

In the material balance of the end-use-approach the demand for the output of a commodity for various industrial inputs as well as for final uses are traced out in sufficient details. The requirement of the commodity for the use as an industrial input is obtained with the help of technological input norms just as in the case of input-output analysis and the known levels of output of the consuming industries. In order to obtain these output levels of the consuming/producing industries the projected sectoral output levels of the input-output analysis may be broken down into subsectors using supplementary studies. One way of accomplishing this may be to study the trend growth of each of the subsectors relative to that of the sector as a whole. The composition of the subsectors obtained in this way may also be adjusted on the basis of any expected change in the product-mix. The final uses of each of the subsectors are obtained in the same way as in the input-output analysis.

Having obtained the output levels and the demand of the various subsectors in the above way, any inconsistency in the demand and supply positions will have to be reconciled by using supplementary information and by re-examination of the different assumptions involved in respect of either the set of norms used or output levels derived.

The above analysis describes briefly the complete procedure of obtaining the necessary aggregate and sectoral details of the various planning variables. It

may be noticed that the whole procedure is divided into three stages and in each successive stage more and more disaggregated information are obtained.

Macro-balances and the input-output analysis may, however, be combined into a single system. But macro-balance analysis has its own uses as well. In this analysis it is possible to play on an aggregate basis with various alternative balances under different assumptions regarding government policies and goals.

The two approaches, input-output and material balance analysis are used in conjunction because both have their own limitations when used independently. While input-output analysis is restricted to a few sectors only because of data and computational limitations, in the material balance analysis there is a problem of obtaining *a priori* information on the output levels of a large number of consuming sectors, which are again interrelated. This combined approach, however, minimises the error due to these limitations as is evident from the procedure already discussed.

It may be pointed out here that proper planning of manpower is intimately linked up with the planning of growth of capacities in various sectors of the economy. The different categories of manpower required in each industry can be estimated through some functional relationship between the employment and the output under given technology. On the other hand, the estimation of active labour force available for different categories of employment has to be based on a detailed analysis of the growth of population by age and sex and the rate of the present and anticipated future participation of the labour force in various economic activities. This would need planning of appropriate educational and training schemes to match the demand and supply of labour force of each category.

The method discussed here for obtaining a set of estimates of aggregate and sectoral economic variables for short term and long term planning deals only with two aspects such as consistency amongst the various estimates and the general economic balances. However, scope exists for bringing in additional economic aspects such as the problem of optimisation under constraints on some economic activities, for which the foregoing analytical scheme needs suitable modifications.

ANTI-HIJACK SYSTEM

Anti-hijacking equipment capable of discriminating between inoffensive masses of metal, such as loose change or keys and potential weapons such as non-magnetic knives or firearms has been designed by a British company.

Incorporating a highly sensitive metal detection system, it is already being used by BPAC at London's Heathrow airport. It detects ferrous and non-ferrous metals, is

unaffected by magnetic fields or passing vehicles, and indicates the whereabouts of the concealed weapons.

Passengers pass through two 1.82 metre high pillars set 83 cms. apart. The pillars house equipment which measures the density of metal objects passing between them and transmits

a signal to a mobile control console, where it is converted by an amplifier into a meter reading. An automatic visual/audio alarm is triggered at a level of calibration predetermined by the operator.

The equipment is easily assembled and dismantled, requires little attention or servicing, and can be designed to operate any type of alarm, including self-locking gates, cameras and video-tape equipment.

A FACT SHEET ON INDIAN PETROLEUM INDUSTRY

THE petroleum industry in India, beginning from a virtual nought twenty years ago, has achieved commendable progress on all fronts,—in exploration, in refining, marketing and developing highly sophisticated consultancy services.

In 1950, India's production of crude amounted to a meagre 2.6 lakh tonnes. By 1969, it had increased 26-times, the output reaching 67.2 lakh tonnes a year.

This achievement has to be noted against the fact that prior to 1955, when the Oil and Natural Gas Directorate (later converted into a Commission), ventured upon a countrywide exploration for oil, India, except for a small area in Assam in the north-east, was believed to be outside the oil-bearing belt.

Since 1955 the Commission has drilled 2,032 wells in various parts of the country. It was the discovery of a rich belt in Naharkatiya in 1953 that gave impetus to further exploration. In 1956 a new field was opened in Moran, Assam. The Commission later extended its activities to Gujarat, where oil was found in 1960. The search has now been extended to the continental shelf, in the Gulf of Cambay, off Aliabet and other places. Arrangements for the construction of a mobile platform for drilling in deeper waters have been finalised.

The Commission estimates that known reserves of crude in India amount to 1312.9 lakh tonnes. Till the end of 1969, we had exploited 357.78 lakh tonnes of the reserves.

Despite the advent of atomic power and the ever expanding output of hydel stations, the demand for petroleum products has gone up five times from 33.2 lakh tonnes in 1950 to 173.36 lakh tonnes in 1969. In terms of per capita, the consumption has risen three times from 8.4 kg per head in 1950 to 28.2 kg per head in 1969.

As for the quantity of crude refined by India's own refineries, the increase is by a phenomenal 70 times: from 2.52 lakh tonnes in 1950 to 174.94 lakh tonnes in 1969. In 1947 there was only one oil re-

finery in India, the one at Digboi in Assam. Today, there are nine refineries, five of them in the public sector, all set up during the past 17 years.

Self-Sufficiency

Since oil is one of the most vital inputs of the economy, Government policy has consistently aimed at achieving commanding heights for the public sector in this field. It was a policy that entailed pioneering and path-finding of the finest order and constant confrontation with private international cartels. Upto 1950 the entire quantity of crude refined in India was done by private refineries. Today the public sector accounts for 54.6 per cent and the private sector 45.6 per cent of the total crude refined in India. Since 1950 there has been a 77-times increase in indigenous output, an increase that brought the country to near self-sufficiency in petroleum products. The output in 1950 was 2.11 lakh tonnes; in 1969 it was 162.38 lakh tonnes. In 1950 we imported 29.4 lakh tonnes of petroleum products. In 1969 the imports declined to 10.5 lakh tonnes. While in 1950, nearly the entire requirement of lubricants was met by imports, today about 60 per cent is met by indigenous plants. Self-sufficiency in the base raw materials for lubricants is expected to be achieved by 1972.

Prior to the advent of Indianoil in 1959, the private sector had enjoyed a total monopoly in the vast market for petroleum products in India. But that position has since been eroded to the extent where the public sector has achieved almost a parity in the market division: 48.2 per cent for Indianoil and 51.8 per cent for the rest. In 1967 Indian Oil Corporation (it was Company till 1963), entered the export market by shipping gasoline to Thailand. In 1969 the Corporation strengthened its international operations by creating a subsidiary, Indian Oil International Limited.

As one of the largest generators of national wealth and employment

opportunities, it behoves on Indianoil to facilitate the just and equitable distribution of the nation's wealth and potential for growth. It was in keeping with this ideal that the Corporation decided in 1971 to give agencies for their products to unemployed graduates and engineers only.

Reaching Rural Areas

The decision in 1969 to open depots and outlets in rural areas (300 so far) for the sale of light diesel oil, (required as a fuel for lift irrigation pumps and for operating low speed *chukkies* and chaff-cutters), also fulfils the community's felt need in a vital area. Retail outlets for high-speed diesel oil will also be opened shortly, and these centres will have facilities for servicing agriculture plants and machinery.

The growth of the petroleum industry has strengthened the country's industrial infrastructure in another significant direction, that of industrial consultancy. With the vast amount of intricate and highly sophisticated tubular structures and other fabrications needed for refineries, there developed in the country the expertise and the know-how needed for the job. Thus, Engineers India Limited, a public sector company, came into being in 1965 to provide engineering consultancy services for the development of petroleum, petrochemicals and other industrial programmes. It is now the largest consultancy firm in the field and is now receiving contracts also from abroad.

BELT CONVEYORS IN INDIA

The total length of conveyors in use on the surface and underground in India in 1950 was approximately 100,000 metres. This went up to 200,000 metres in 1960, to 280,000 metres in 1965 and now stands at 410,000 metres, reflecting a growth of 400 per cent in 20 years. At Talcher Coal Handling Plant, the conveyor system is 9 km long and is said to be the longest coal handling system in Asia.

DANISH GOVERNMENT SCHOLARSHIPS 1971-72

Applications are invited from Indian nationals and subjects of Sikkim for post-graduate studies in Denmark.

Subjects : Veterinary Science, Seed Pathology, Horticulture, Forestry, Dairy Technology, Fermentation Technology, Architecture and House Planning, Ship-Building and Naval Architecture, Structural Engineering, Chemical Engineering, Electronics and Nuclear Structure.

Number, Duration and Value : The total number of scholarships in all subjects in eight (8). These scholarships are tenable for a period of twelve months and carry a stipend of D. Kr. 1,750 (Rs. 1,750 approximately) per month and premia of scholar's insurance against sickness, accident and third-party liability.

Passage Cost : Passage costs to the selected candidates may be given upon their making application to DANIDA through the Royal Embassy of Denmark in New Delhi.

The nomination for scholarship does not automatically mean grant of the scholarship, as this will be dependent upon the possibility of the course being actually available.

Qualifications and Experience:

(i) **Veterinary Science, Seed Pathology and Horticulture :** A Master's degree in Agriculture with a first class at Master's or Bachelor's degree level and at least two years' consecutive teaching/industry/research experience in the line after the above qualification.

(ii) **Forestry :** Post-graduate Diploma in Forestry or A.I.F.C. certificate from the Forest Research Institute and College, Dehra Dun and at least two years' consecutive teaching/industry/research experience after the above qualification.

(iii) **Dairy Technology :** At least a Master's degree with first class either at Master's/Bachelor's degree level or a post-graduate Diploma in Dairy Science from the National Dairy Research Institute and at least two years' consecutive teaching/research experience after the above qualifications.

(iv) **Fermentation Technology :** At least a Master's degree in Bio-Chemistry with first class either at Master's or Bachelor's degree level and two years' teaching/research industry experience after the above qualifications.

(v) **Architecture & House Planning, Ship-Building & Naval Architecture :** First Class Bachelor's degree in the subject or equivalent qualifications and at least two years' consecutive teaching/research/industry experience after the above qualifications.

(vi) **Structural Engineering, Chemical Engineering :** At least a Master's Degree in the subject concerned with first class at Master's or Bachelor's degree level and two years' consecutive teaching/research/industry experience after the above qualification.

(vii) **Electronics :** At least a master's degree in Physics with special reference to Electronics or a first Class Bachelor's degree in Tele-Communication and two years' experience after the above qualifications.

(viii) **Nuclear Structure :** At least a Master's Degree in Physics with first class at Masters's or Bachelor's degree level and two years' consecutive experience in teaching/research after the above qualifications.

Note : Candidates who have already been abroad for study/research/specialisation/training either on a scholarship or on their own are eligible if they have been in India for at least three years on 15-3-1971 after their return.

Age : Candidates should be NOT less than 25 years of age and NOT more than 40 years on 1st September, 1971.

Last date of application etc. Applications must be made on the prescribed form so as to reach the Ministry of Education and Youth Services, Government of India, Section E.S.3, Room No. 516, 'B' Wing, Fifth Floor, Shastri Bhavan, Dr. Rajendra Prasad Road, New Delhi-1, by 25th March, 1971. No application form will be supplied after 20th March, 1971. For detailed information and application form, please apply enclosing an unstamped self-addressed envelope (23 cm x 10 cm) to the Ministry of Education and Youth Services, E.S. 3 Section, 'B' Wing, Fifth Floor, Shastri Bhavan, Dr. Rajendra Prasad Road, New Delhi-1.

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KHADI AND VILLAGE INDUSTRIES IN INDIAN ECONOMY

- * 21 lakh persons are gainfully employed
- * Rs 105 crore worth of goods produced in this sector—Rs 26 crore in khadi and Rs 79 crore in village industries
- * Rs 27 crore distributed as wages
- * The programme is spread in 1.25 lakh villages all over the country

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YOUR MONEY GOES WHERE IT IS MOST NEEDED

Khadi and Village Industries Commission
Bombay-56

Milestones in Uses of Atomic Energy

Two short ceremonies at the headquarters of the International Atomic Energy Agency in January marked important steps in the development of the peaceful uses of atomic energy in India.

The first was the signing of an agreement for the application of safeguards over nuclear material and equipment at the Tarapur nuclear power station, which with an electrical output of 400 megawatts from two reactors is the largest in Asia and the first such installation to come into commercial operation in a developing country. The Tarapur power station, providing electricity to the states of Gujarat and Maharashtra, was dedicated officially in January 1970.

In the second ceremony, the Bhabha Atomic Research Centre, Bombay, was offered a one-year contract for research on the development of procedures for the production and control of short-lived radio-pharmaceuticals for medical use.

Radio isotopes are now used extensively in many branches of medicine in diagnosis and therapy. The project to be undertaken at the Bhabha Centre, under the direction of Dr V.K. Iya, is an integral part of the Agency's coordinated programme of research on radio pharmaceuticals, which is to be carried out in close consultation with the World Health Organisation.

INDIAN SCIENTIST TO TEST MOON ROCK

The U.S. National Aeronautics and Space Administration has selected Professor P.S. Goel of the Indian Institute of Technology, Kanpur, to conduct research on the nitrogen content of moon rock dust brought back from the moon by Apollo astronauts.

The dust, weighing a few grams, will be flown to India and subjected to a series of tests by Professor Goel. The Indian scientist, who holds a Ph. D. degree in Chemistry awarded by the Carnegie Institute of Technology, will subject the lunar material to irradiation at the Bhabha Atomic Research Centre, Bombay. Later he will perform a radiochemical analysis of the moon rocks at the Indian Institute of Technology, where excellent facilities for such work are available.

Dr Goel thinks that the solar wind, which flows steadily outward from the sun, may have deposited a layer of nitrogen on the surface of moon rocks. By irradiating the material, Dr Goel will peel off this solar wind-borne layer of nitrogen. He then proposes to establish the original content of nitrogen in the rocks prior to their exposure to the solar winds.

The Kanpur educator has conducted similar work on meteorites. At Kanpur he has helped build a research laboratory in nuclear chemistry.

Recognising the originality of the techniques outlined by him, NASA has chosen Dr Goel as principal investigator of the project which is expected to last approximately one year.

RUBBER REPLANTATION

Our Trivandrum Correspondent

Rubber cultivation and even its replantation is being encouraged by the Rubber Board. For replantation work subsidy is given at the rate of Rs 2,471 per hectare (Rs 1,000 per acre) for those rubber plantations that have become unprofitable owing to decline in production and that had been cultivated before 1956 and have been registered with the Board earlier than April 1, 1958. The minimum area for which the subsidy is given in seven instalments, is 0.40 hectare, the first instalment being Rs 988.40 per hectare.

Under another scheme, in force since 1966, loans are given to small cultivators of rubber for new plantations. Planters whose rubber plantations do not exceed 20.234 hectares (50 acres) in area are eligible to get this loan provided they are registered with the Board. The loan is at the rate of Rs 3,459.40 per hectare paid in seven instalments for extending the cultivation of rubber to a minimum area of 2.023 hectare (5 acres) and to a maximum of 20.234 hectares.

SAL OIL IN INDIAN ECONOMY

Greater exploitation of minor forest products such as resins and seeds can enrich the economies of developing countries. Efforts are being made in India to substitute vegetable oil, tallow and resin now used in soap with sal seed oil.

Experiments were also being made to use the residue after the oil had been extracted from the sal seeds as a component of feed for poultry and cattle. Some 25,000 tons of sal seed were gathered last year and perhaps as much as one million tons could be harvested annually.

Sal grows over some 25,000 sq. kms. in India and is also found elsewhere in South East Asia. Reaching heights of 30.48 metres to 38.10 metres sal is India's main source of construction timber.

Another minor forest product important to India's economy is the 25 million worth of oleoresins from which resin and turpentine are produced.

NPL DEVELOPS ARGON ION LASER

A pulsed argon ion laser has been developed and successfully operated recently at the National Physical Laboratory, New Delhi. The highly ionized plasma required in the laser has been obtained by discharging a condenser through a column of argon at low pressure to give a peak current of 100 amp. A Brewster angle type of laser tube was used, so that the highly ionized plasma may not damage the dielectric coated mirrors. The laser emits

a single pulse or repetitive pulses, each of a few micro-seconds duration. Three such lasers have been built to measure the power and other beam parameters. These are perhaps the first indigenously made ionic lasers to be commissioned in the country.

Argon ion lasers have very important application in holography and spectroscopy. Its recent use in the USA for the precise measurement of the distance of moon is well known.

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INCREASE IN TOURIST TRADE

from Page 18

rooms. Against this, India would be able to raise only 6,000 rooms. There would be a shortage of nearly 4,000 rooms. To cater to the needs of the new class of tourists consequent on the structural changes in their class, we need a number of hotels in the one, two and three star categories.

Computerised Communications

In many countries where tourism has been accepted as a major business, the services of the electronic computer have been utilised to speed up communication, decision-making and thereby to improve the efficiency of the trade. A part of our tourist earnings can be transferred for partaking of the world wide computerised communication system. This system can feel the movements of the international travel and information about the origin, dispersion and destination of the tourist currents emerging from the various parts can be transmitted to the receiver. The ARCO, the ALITALIA Automatic Reservation and Communication system is a typical example. The system has provided lightning services in the form of planning itinerary around the world and covers 350 enquiry stations. The network is being spread in almost all important centres in the world. The questions by the customers are debated on the key board and the answers instantaneously appear on the screen within two seconds with variations in the form of alternatives for the particular day and hour as well. The system also records a tourist's wishes like a hotel, a car at a particular destination, a special dinner on board, entertainment evening, all of which are arranged within seconds after feeding the enquiry.

Whether in the field of facilities planning, techno-economic studies for development of tourist resorts, construction of hotels and theatres, selection and development of winter sports, study of the tourist preferences

and spending habits, cost-benefit analysis of marketing of tourism, some of the functional and technique-oriented facets of industrial engineering can be fruitfully applied for quickening the process of decision making.

For instilling new hope into the progress of the industry, the Government's enthusiasm and optimism are not sufficient. The edifice of the tourist industry primarily rests on the cooperation of all.

AGRICULTURE IN ASSAM

from Page 31

ICAR, is doing excellent work in Upper Shillong. Some blight-resistant varieties from the central station have been successfully tried in the Hills and the more suitable varieties among them will be introduced in the Plains also. For the past two years, potato crop has been suffering from blight. To prevent it, aerial spraying is being introduced this year.

The research conducted at the Fruit Research Station has indicated the possibility of increasing pineapple yield four to five folds by adopting scientific methods. Banana is also a widely grown fruit crop of this area and attempts are being made for commercial scale cultivation of Dwarf cavendish variety of banana.

With the establishment of the Assam Agricultural University in 1968-69, a long-felt need of the State has been fulfilled. The major research schemes of the Department of Agriculture have already been transferred to the University. It is expected that within a very short period the Assam Agricultural University will be able to coordinate research, extension and education in agriculture in the chronically flood-affected State of Assam.

NIRODH OUTPUT TO BE DOUBLED

From Our Trivandrum Correspondent

Nirodh production at Hindustan Latex, in Trivandrum, the only condom producing factory in the public sector, is soon to be doubled. The factory, which started production in August last year, now makes 144 million pieces of the contraceptive. The new unit, which will be an adjunct to the existing Rs 1.4 crore unit, is estimated to cost Rs 80 lakh.

Using its own knowhow, the Hindustan Latex have fabricated a machine capable of packing one million pieces of Nirodh a month. The machine has been tested and would be commissioned when the proposed new unit goes into production.

TO OUR CONTRIBUTORS

Articles which are not accepted for publication in the Journal will be returned only if they are accompanied by self-addressed stamped envelopes. It will not be possible to attend to interim inquiries.

Contributions to YOJANA must be original and exclusive.

Contributors are requested to give weights and measures in the metric system only.

Contributors are also requested to indicate the source of all statistical information.

BOOKS

Metamorphosis of a Tribal Village

Cultural Configuration of Ranchi : A Survey of an Emerging Industrial City of Tribal India (1960-62) by L.P. Vidyarthi. Published by J. N. Basu & Co., Calcutta. Pages 412. Rs 40.

B. N. Nair

THE study of urbanisation in developing countries has assumed tremendous importance in recent years. While the planners are faced with the urgent problems of urban congestion, the anthropologists, sometimes, relate them rather leisurely to the larger and farfetched questions of political socialisation and culture change, with their distinct *penchant* for development economics and in this process, forget the stark Indian realities. The basic task in India, in both directions, has been rendered easier by the important work done by certain celebrated British scholars. Although the times have changed, these have their unmistakable relevance to Indian conditions even today. The heritage has been fortunate, and particularly so, for Ranchi, which had started its career as a small tribal town in the Chotanagpur Plateau in 1834 under a Captain Wilkinson, and is today the seat of the Heavy Engineering Corporation and other allied industries.

The book under review is a meeting point of the new fangled enthusiasm of the Indian planner for tribal life and the thorough-going re-examination of the groundwork legated by British scholars and Missionaries that is taking place in a predominantly tribal area in Bihar. As a Survey sponsored by the Research Programme Committee of the Planning Commission, it is doubly significant on two counts, viz. (a) in embodying an assessment of the extent to which modern survey techniques could be feared to undertake the study of complex societies in India, and (b) in preparing the ground for understanding the problems of tribal integration in our scattered industrial-

society. On the first count it is somewhat gratifying that Mr Vidyarthi and his research team have spared no efforts to graft new ideas in keeping with their objectives of doing a configurational study of Ranchi City. However, while the aim has been to adopt multi-disciplinary approaches, it has been offset evidently by an overbearing impress of applied anthropology without the concomitant catalysing process of other disciplines. And yet, the approaches adopted are complementary to and, perhaps a corrective also, to the determined drives in the direction of economic analysis that is relentlessly invading industrial and agricultural economics in this country. On the second count, the present study has distinctly contributed to the deeper understanding of some of the intrinsic problems of tribal integration in our fast growing industrial society. As an advocate of applied or action-oriented anthropology Mr Vidyarthi has studied practical questions like the civic problems created by rapid urbanisation, deterioration of housing conditions, sewerage and sanitation problems and has happily devoted only limited space for caste configu-

rations and their baleful effects. He says, "Caste is now a political fact and needs a political therapy. The political therapy includes the use of political power to bring about caste-free leadership which may work for the distribution of economic opportunities in a caste-free manner and which may ensure the economic minimum to all, irrespective of caste and kin considerations." (P. 218). This is a positive viewpoint with which one can hardly disagree.

The major recommendation of the Survey is to develop Ranchi within the matrix of Regional planning. In this connection it is somewhat baffling to the researcher why no action has been taken on similar recommendations made by surveys conducted by various agencies during the last 15 years. What has been done about them by the State Governments? The task for regional planning would appear to be to follow up some of these recommendations rather than await the submission of further survey reports. Mr Vidyarthi has conveyed simple truths in a convincing manner and with a sense of urgency.

Electricity and Development

Electricity and Economic Development of Madras (Tamil Nadu) State by K.S. Sonachalam. Published by the Research Programmes Committee, Planning Commission. Pages 256. Rs. 22.50.

M. R. Kulkarni

IT is very well recognised in the development plans of the newly independent countries that electricity is an important element of infrastructure along with railways, roads, coal and steel. The link between electricity and economic development constitutes a subject of absorbing interest. The Research Programmes Committee of the Planning Commission appropriately sponsored a number of research projects under the Regional Deve-

lopment Series during the Third Plan period. The present study is one of them. The choice of Madras State (Tamil Nadu) was indeed very happy because that State happens to be among the pioneers in power in India. Also the State offers a significant case study in the pattern of electricity consumption. The central theme of the study is not, however, the impressive power development in the State; or the use pattern; but the evaluation of its impact on the development of the State. However, the task of evaluation, it can be easily seen, is not simple. For one thing, the theoretical tools of cost-benefit analysis are still far from perfect. Secondly, though a number of evaluation studies pertaining to irrigation

projects in India have been carried out, this kind of study is "without hardly any precedent." Moreover, what makes it more complex is the fact that it does not aim at assessing the benefits of a specific power project but of power development in general over a wide area and a long span of time.

Starting with so many built-in handicaps, the study seems to be foredoomed to be diffused and open-ended. Prof. Sonachalam has taken a sectoral approach, namely to evaluate in turn the impact of power on industry, agriculture and so on. But the impact of electricity on industry, agriculture and the rural sector as assessed by him does not quite add up to the total impact on the economy, the tentative nature of even this sectoral assessment notwithstanding. The method of estimating the contribution of electricity in comparison with the cost of alternative fuel is all right. But the assumption that but for electric power industrial or other development would have been negligible is open to question. While the author has attempted an estimate of indirect benefits he has not gone into "social" costs and "social" benefits. For example, it would be meaningful to go into the secondary and indirect benefits of using coal in terms of the boost up for railways, the coal industry etc. It is also essential

to make use of "shadow" prices in arriving at more rational cost-benefit ratios. To adopt the existing tariffs as norms of costs is to sanctify them. The case for higher tariffs is strong even by the mundane market demand and supply conditions. Thus it can be seen that there is no real confrontation in the study between total costs and total benefits, however, defined.

A large number of quotations and extracts from various authorities used all through the study look unnecessary and amateurish. The history of electricity and industrial development as also the survey of the theory of evaluation are long and repetitive. The synopsis of the study and the summary following each chapter also take a good portion of the publication. The table showing power intensity of various industries is superfluous. Though the author starts with the objective of attempting a cost-benefit exercise, he often tends to describe the general impact. In the process, the study has assumed an amorphous character. In any case, the casual connection between power development and the expansion of the economy has not been established, though the whole treatment appears to take it for granted that all the development was directly and exclusively related to the pace of power generation.

Obstacles to Rural Industrialisation

Socio-Psychological Factors Influencing Industrial Entrepreneurship in Rural Areas. A Case Study in Tanuku Region of West Godavari, Andhra Pradesh by V. R. Gaikwad and R.N. Tripathy. Published by the National Institute of Community Development, Hyderabad. Pages 140; price Rs. 6.

J. S. Kochar

THE problem of rural industrialisation is, to a great extent, the problem of attracting wealth, accumulated with rich landholders, towards industry. In the report under review it has been shown how even the perception of a threat to landed property under the impending land reforms gave a strong motivation for finding out alternate ways for saving this wealth. When these reforms did not come through effectively,

the landed classes, except those few who had transferred their wealth from land to other agencies in the early stages, continued to hold the wealth as in the past. It has been pointed out in the Study that stringent land reforms can provide considerable capital for industrial development in rural areas, provided an extension-cum-technical advisory cell at the district level, a technical planning and advisory, task-oriented body and a market research cell at the State level are created. These steps could be supplemented further by providing tax relief on the capital diverted from land for investment in small scale industries in the rural areas.

The present Study was undertaken by the National Institute of Community Development in June, 1969, at the instance of the Andhra Pradesh Government. It is a micro-

scopic depth study which covers a number of entrepreneurs of the region. While the main focus has been on industrial entrepreneurship, it has also been considered necessary to cover a small number of those in business, in order to get a comparative picture of emerging entrepreneurship in industry and trade.

The Study has brought out some revealing facts. It has been pointed out that local entrepreneurs are not ignorant of the great scope for starting new industries but most of them do not have the requisite technical know-how and competence. Lack of timely availability of finance and the problem of marketing non-traditional products are other points made in the Study. The rural entrepreneur looks to the Government for the solution of these problems.

The appendices to this useful Case Study contain a profile of Tanuku Taluk, the pattern of industrial growth in Tanuku region, a list of factories (large industrial establishments) under the operation of the Factories Act, 1948, and a list of small industries together with the number of establishments and persons employed therein. There are a number of tables giving information about the occupational pattern of the Tanukus, the levels of development of the Taluk and year-wise distribution of industries according to their types.

Indo-German Cooperation

India and Germany—a Survey of Economic Relations. Edited by Vadilal Dagli. Published by Vora & Co., Bombay. Pages 232. Rs. 20.

T. K. Parthasarathy

DEPENDENCE of nations on each other for their economic growth is neither new nor undesirable. India's relation with Germany has been very close in the fields of culture and literature. One cannot but think of Max Mueller, the great German Indologist who has translated many of the Indian classics. Indo-German economic relations and cooperation are equally strong, though not ancient and Rourkela is the boldest example

of such cooperation between the two countries. The book under review surveys the scene in a matter-of-fact way. The editor in the introductory chapter has made an objective analysis of India's trade deficit which can be cut down by increasing our exports. But this process has been very slow. A major part of India's exports to Germany still consists of traditional goods. With the labour market becoming costlier in the West, it will be worthwhile to increase exports of labour-intensive manufactures from India. The editor has made valuable suggestions about the shape economic aid should take and the ways in which Germany can be of assistance to this country without taking any economic burden on herself.

The book has been divided into three sections. The first deals with a general survey of relations between the two countries. The second provides a wide canvas on the German market economy and its various industries. The last section gives a penetrating analysis and picture of economic cooperation. The carefully chosen subjects and their authors

provide a wealth of information on this subject. Industrialists and businessmen will find this compilation very useful while it will prove to be a good reference source to students of economics. Statistical information in the last chapter is a forte of the book.

The New Rural Leadership

The Rural Elite in a Developing Society by V.M. Sirsikar. Published by Orient Longmans Ltd., New Delhi. Pages 227. Rs 20.

The introduction of adult franchise and the democratic decentralisation of power at local level through Zila Parishads and Taluk Panchayats have helped the emergence of a new rural leadership which is slowly, but surely, replacing the political leadership of the urban elite. The rapid increase of agro-industries in the cooperative sector is giving the rural masses an increasing hold over the rural economy. The new socio-economic set-up, thus, has made

tremendous impact on rural India, politicalising the hitherto apolitical sections of the community. In this context a question is being repeatedly asked: What is the calibre of the emerging rural leadership? Mr Sirsikar's research work, sponsored by the Research Programme Committee of the Planning Commission, gives the reader a deeper insight into this aspect of the leadership through copious data based on a sample survey undertaken in three select districts of Maharashtra. The study contains figures regarding the standards of education and living of the local leaders, their mental make-up, their response to development projects, as also realisation by them of the responsibilities thrown on their shoulders.

All this some may find relevant only to a limited extent, and that too to the areas selected by the author. His analysis may not be fully tenable if applied in an all-India perspective, but it surely throws much light on the type of leadership that is emerging through the democratic process at work in the country.

R.D.P.

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LETTERS

STUDENT UNREST

Mr K. Madhvan Nair's assertion (*Yojana*, November 1, 1970) that "the student unrest is being unnecessarily played up to give the impression of a youth revolt", carries meaning. But he has overlooked that local problems facing each university and every college have, when not tackled at the right time, caused trouble in the campuses.

The Jhala Committee's recent report on the medical faculty of Patna University is a pointer to the fact that the guardians of law themselves succumb to influences

and pressures. At times to save their own skins they compromise on vital issues leading to loss of faith in their integrity. Yielding to such pressures leads to colossal waste of public funds. Sometimes the lack of initiative and proper perspective in framing rules results several lacunae that call for successive amendments. This in turn creates a feeling of uncertainty. As a result, lawabiding persons suffer; they also develop disrespect for law.

At times skinsaving and short-sighted authorities try to please the more vocal sections of the student community, thus creating a difficult precedent for other institutions.

The problems do not end; they rather pile up, and are exploited by disgruntled elements

on the campuses and in the society.

Similar situations prevail in other campuses too, the difference being only in the degree of deterioration. This is often confused with student revolt.

The suggestion for associating students in policy-making and administering bodies of the universities is nothing but another method of pleasing the vocal section of the students.

Universities cannot justify their existence by admitting only the first raters. They have the obligation to convert the second and third raters into first raters, of turning bad material into a refined one.

Mesra, Bihar A.N Rama

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With the January 10, 1971 issue YOJANA completed its fourteenth year of publication. As in previous years a selected index of material published during the year has been prepared. Except for articles published in January 10, 1971 issue the date shown refers to the year 1970.

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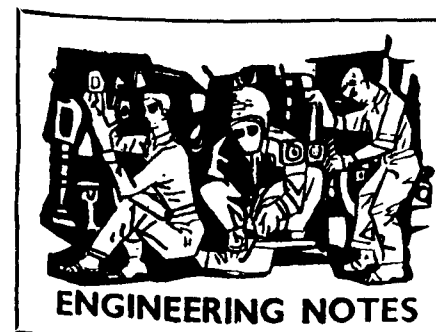
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NGEF to Produce Silicon Diodes

NGEF Ltd., Bangalore, will soon start manufacture of high capacity silicon power diodes, right from the crystal stage, in technical collaboration with a West German firm. It is expected that the commissioning, testing and initial production will commence later this month.

The factory will be equipped with the most sophisticated production and will be to a very great extent skill-oriented. The AEG-D-400 series which will be manufactured, is the latest improved version in the whole range of power semi-conductors manufactured by AEG-Telefunken. These diodes have an average forward limiting current of 400A and peak reverse voltage as high as 140V to 2600V. The manufacture process of the semi-conductor is highly intricate and exacting, and will have to be done in a clean and dust-proof airconditioned factory.

India to Produce Sophisticated Fertiliser Equipment

Bharat Heavy Electricals Limited and Nuovo Pignone of Italy have signed a collaboration agreement for the manufacture of centrifugal compressors required for the fertiliser and chemical industries. The manufacture will be undertaken at BHEL's plant at Hyderabad.

These highly sophisticated compressors are of large capacity and are most essential for the production of fertilisers. Their manufacture is being undertaken for the first time in the country.

The annual production is estimated to be around worth Rs 3 crore.

Boiler Plant Sets up Record

A number of production records were set up in December 1970 at the Boiler Plant at Trichirapalli, Tamil Nadu.

At the Welding Technology Centre, 40 high pressure welders were qualified and 51 tonnes of components involving 330 sequences were produced. This would enable faster completion of boiler groups and would also help the main production boys to concentrate on major production.

The second record was set up in Boiler Shop-1 where three drum mills were fabricated and machined during December 1970. The normal production of the Boiler Shop is two drum mills.

The drum shop furnaces also carried out 60 heat treatment cycles during December 1970 as against the average of 45 to 50 cycles per month.

Production in the new header shop reached a peak of 29 tonnes of loose headers and 12 tonnes of assembly headers as against the normal production of 25 tonnes.

Indian Firm to Build Textile Mill in Malaysia

"India Malaysian Textile Berhad", a joint venture of the Birla Companies and Malaysia is to be set up at Butterworth, Malaysia. This composite textile mill for various man-made fibres will have modern and sophisticated machinery, a considerable portion of which will come from leading Indian manufacturers.

The design, supply, and installation of the electrical equipment needed special engineering expertise and experience. An Indian firm, Siemens India, Bombay, have been entrusted with the execution of this project on a turnkey basis. The equipment includes various types of switchboards and distribution boards.

Siemens will be deputing senior technical supervisors to Malaysia for supervising the installation of the plant. This is the first time that an electrical firm in India is taking the total responsibility for such a project in a foreign country.

Fatigue Testing Machine

A fatigue testing machine for concrete beams in flexure has been designed and fabricated by the Central Road Research Institute, New Delhi. The prototype machine has been run under trial for over two years and the results have compared favourably with those reported in use abroad. All the raw material needed for fabrication of these machines is available indigenously. The machine can be manufactured in any workshop with requisite facilities.

Fatigue testing machines are not produced in the country. The present requirements are met through expensive imports. Since fatigue is one of the important properties of concrete, the testing machine will be useful in any laboratory working on concrete problems. Organisations, other than some Government departments, by and large, are doing without this unit and obtain fatigue data from abroad. The annual initial demand for the machine is about 50 units. The estimated cost of production of such machines on small scale is Rs 5,500 per unit.

Indian Maritime Fleet

Steps are being taken to acquire 74 ships during the coming three years in order to reach the Fourth Plan target of 40 lakh GRT. These will include 14 large tankers and bulk carriers so that a higher share of Indian shipping in transporting bulk cargo, which forms 65 per cent of the total trade, could be achieved. The operating tonnage on February 1, 1971 was 23.97 lakh. The tonnage firmly on order on that day was 7.25 lakh GRT and that sanctioned by Government for acquisition was for another 2.40 lakh, making in all 9.65 lakh GRT.

The emphasis during the Fourth Plan period has been laid on acquiring large tankers and bulk carriers so that the share of Indian shipping in transporting bulk cargo could be increased. The domestic production of vessels is also making steady progress. The Hindustan Shipyard Ltd., has now concluded 5 contracts for 9 vessels, of which 7 are of 14,000 GRT each. Including seven others already under execution, the total accounts for 1.79 lakh GRT. Mazgaon Dock has also orders for 2 passenger ships with 0.17 lakh GRT.

Development Diary

- * The Government of India has granted a licence for setting up a Rs 5-crore factory at Nasik to manufacture tractors. It will produce about 10,000 tractors and air-cooled diesel engines every year.
- * The Maharashtra State Electricity Board has till February 1, 1971 energised over two lakh pump sets for the supply of water to the agriculturists. This places the State next only to Tamil Nadu which has so far energised the largest number of pumps for this purpose.
- In the matter of electrification of villages, about 33.84 per cent, that is, 12,300 out of over 33,116 villages in the State, have been electrified. In this case, Maharashtra ranks fifth among all the States.
- * The Union Ministry of Irrigation and Power has sanctioned a loan of Rs 20 lakh to the Government of Kerala for the 100-km long Pamba (Kerala)—Kayattar (Tamil Nadu) 220 kV S/c Inter-State transmission line. This link along with the 112-km long Idikki (Kerala)-Udumalpet (Tamil Nadu) 220 kV S/c line would enable transmission of about 400 MW surplus power from Kerala to the southern part of Tamil Nadu.
- * India received a total of 2.80 lakh foreign tourists in 1970, recording an increase of 14.8 per cent over the corresponding figure of 2.44 lakh for the previous year. Out of these 2.06 lakh tourists came from affluent countries, namely, America, Europe and Japan. Earning in foreign exchange from the tourists in 1970 are estimated to be Rs 38 crore as against Rs 33 crore in 1969.
- * For the first time, the Asian Dehydrateds Ltd of Nasik have been able to export Rs 18 lakh worth of dehydrated onions in the face of stiff competition in world markets.
- * Agreements for three loans have been signed under which Britain has committed Rs 28.8 crore

project aid to India. The three loans are intended to finance the purchase by India of British manufactured capital good required for Indian development and to cover the British element of major projects.

- * The Libyan Government has awarded to the National Industrial Development Corporation, New Delhi, a consultancy contract valued at Rs 13 lakh, for the planning and supervision of an electric-steel-scrap melting plant, to be set up near Tripoli.

* Bharat Heavy Electricals Limited and Nuovo Pignone of Italy have signed a collaboration agreement which will enable BHEL to undertake the manufacture of centrifugal compressors required for the fertiliser and chemical industries. The manufacture will be undertaken for the first time in the country at BHEL's plant at Hyderabad. Production is expected to be of the order of about Rs 3 crore a year.

- * The United States has extended a loan of Rs 48.48 crore to the Government of India to finance a part of the expenditures on major development activities during the current Indian Financial Year. The loan has been made from the sales proceeds of agricultural commodities supplied to India under Public Law 480 agreements concluded between 1967-69.

* According to an estimate of the Indian Bureau of Mines, the value of mineral production in India was Rs 9.9 crore in January, 1971, registering an increase of about 6 per cent as compared with the previous month. This excludes the value of mineral fuels except lignite, minor minerals and atomic minerals.

- * The sale of Nirodh in the country registered a rise of 116 per cent in December 1970 over last year's figure during the same month. The consolidated figures for the country reveal that 4.60 million pieces of Nirodh were sold.

YOJANA

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BIG DEEDS

HUMBLE MEN

In this feature Yojana seeks to present the outstanding achievements of some of the many millions of obscure men and women who are working to build tomorrow's India.

A GOLDSMITH TURNED FARMER

"The Small Farmers Development Agency came as a boon to me", said Ramdeo Sah, a goldsmith turned farmer of village Dholbaza under Forbesganj block of Purnea district.

A former Secretary of the Forbesganj Swarnkar Sangh, Sah had a shop in a "gumti" of Forbesganj market. Though he had a land-holding of about three acres in the village, Sah had never thought of cultivating it. He met all his requirements of foodgrains from the local market.

One day, he met Krityanand Roy, an officer of the Small Farmers Development Agency, who persuaded him to cultivate his land which had hitherto been lying fallow. Mr Roy explained to Sah that the aim of the Small Farmers Development Agency was primarily to help small farmers like him with holdings of 2-5 acres of land. He advised Sah to take a loan under this programme for cultivating his land.

Following Mr Roy's advice, Sah secured a loan of Rs 700 from the Forbesganj branch of the State Bank of India under the SFDA scheme for the purchase of bullocks and installation of a hand tubewell.

He started his career as an agriculturist by sowing paddy on his land. His paddy yield was higher than of many other farmers because he made proper use of fertilisers. His very first crop enabled him to pay back Rs 125, the first instalment of the loan, to the State Bank.

Sah has now become a wholtime progressive farmer.

BEST PANCHAYAT UNION IN CHINGLEPUT

The Maduranthakam Panchayat Union was adjudged the best among panchayat unions in Chingleput district of Tamil Nadu for 1969-70 and given the "rolling shield" for the year.

A major achievement of the panchayat union is the remarkable success it achieved through a crash programme with IR-8 paddy strain during the year 1969-70. A target area of 12,000 acres was given to the union for the crash programme. With favourable seasonal conditions, following a long period of drought, timely supply of agricultural inputs, availability of adequate credit, the panchayat union overcame local difficulties and was able to bring 12,532 acres under IR-8, thus exceeding the target.

Another important step forward was adoption of seed broadcasting for raising IR-8, instead of the traditional method of transplantation. This broadcasting method has the advantage of giving yields as high as 3050 kgs. per acre.

The panchayat union has also achieved creditable records of performance during 1969-70 in rural reconstruction.

NURSERY EDUCATION IN RURAL KERALA

Nursery education is becoming increasingly popular in rural Kerala. Nursery schools are being established in many villages in the district, providing pre-school education to the children of weaker sections of the people.

These nursery schools are being organised with the help of voluntary organisations, including several women's organisations functioning in the villages. These voluntary organisations have been able to get help from the local people by way of small contributions and voluntary services by educated young women. With literacy levels being high and educated unemployment around, it was no problem at all to get educated young people to work in the nursery schools. Many of them even work without getting any monetary benefit.

Since the majority of students in these schools are drawn from the families of agricultural labourers, only a few pay a nominal fee. The schools, supported by contributions collected from the local people, offer a two-year pre-school course for children.

SAMSABAD SOLVES ITS EMPLOYMENT PROBLEM

Samsabad is a village about 60 km. from Allahabad, which has given a lead in solving the unemployment problem by setting up small-scale industries. The village, famous for the manufacture of utensils, has now the added facility of electric supply. With the coming of electricity, about 80 per cent of the villagers have taken up the work of producing and finishing of utensils, and of supplying them to the markets at Allahabad and Kanpur. The villagers are finding their work very satisfying and feel happy and proud.

There are now about forty small factories scattered all over the village, and the zeal of the villagers, including women, deserves praise.

FAMILY PLANNING DRIVE IN RAIPUR

As a result of the intensive family planning drive in the two selected primary health centres of Pithora and Kasdol in Madhya Pradesh in April this year, 228 persons including 107 women accepted sterilization. The number of persons who accepted other contraceptive methods exceeded 400. The drive undertaken by the Raipur District Family Planning Bureau covered a total population of 60,000 in Pithora and 40,000 in Kasdol. Extra-medical staff were posted on the spot for follow-up of operated cases.

Mass meetings, film shows, group discussions, intensive individual contacts and distribution of literature etc. were the other main activities. In all 90 film shows and 80 mass meetings were conducted in 310 villages under the two primary health centres. More than six thousand eligible couples were contacted.

INDIA BIGGEST EXPORTER OF TEXTILE MACHINERY

India has become one of the biggest exporters of textile machinery to some of the Arab countries. Textile machinery worth about Rs 47 million was recently exported to the UAR. A fresh order for textile machinery worth about Rs 60 million to the UAR is expected to be executed very shortly.

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LEST WE FORGET

Devoted each to his own duty,
man attains the highest perfection.

—Bhagavad Gita

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REASSURING PRIORITIES

THE President's address to the joint session of the Fifth Parliament found an answering echo in millions of hearts. The accent on the urgent need to banish poverty, and the reaffirmation of Government's resolve to implement "the economic and social transformation" of the country, have given new hope to the people for a more rapid realisation of the promised millennium. At the same time it has put a greater measure of accountability on those who gave the promises. The address, therefore, had a tone of pragmatism and zest for achievement. If it was in any way less spectacular in the matter of holding out fresh promises, it was because the country at present expected nothing more or nothing less. Therefore, the Presidential Address took the first opportunity to review the entire range of commitments the ruling party has accepted, and outlined several measures that the new Government intends to take towards ensuring social justice and equality of opportunities to the people, who, in the President's words, had asserted their sovereignty through the ballot box. As the President declared, "theirs is a massive mandate for peaceful change that must swiftly and visibly alter the picture of poverty and alienation in our land".

Apart from expressing the concern for rising prices which were almost eating away the benefits of the augmented national and per capita incomes, the Address naturally took serious notice of the problem of unemployment to which the Government intends to give the highest priority. As a part of the exercise the Government will identify the specific directions in which development programmes could be further reinforced in a determined effort to deal with this problem. The Crash Scheme for Rural Employment, to be implemented from the current financial year, was promised to be made "the nucleus of a comprehensive programme for the expansion of employment," and "this programme will be linked to schemes for raising the productivity of agriculture" such as minor irrigation, link roads and electricity and water supply schemes. Besides pursuing the objective of imposing a ceiling on urban property and laying the stress on land reforms for which a Central Land Reforms Committee has already been set up, the Centre will persuade the State Governments to promote a more equitable agrarian structure and draw up a national plan for the application of science and technology to economic development. Urban poor have not been forgotten in the Address which assures a prominent place for slum clearance and improvement programmes. Simultaneously rural housing conditions will also receive due consideration.

In these reassuring priorities a reappraisal of the Fourth Plan has also been promised to enable the Government to review and reorient the Plan for increa-

sing the pace of development and ensuring a more effective use of investment in the economy. Whereas a task force will be appointed to remove obstacles that come in the way of the speedy implementation of investment programmes, both in the public and private sectors, and to step up the rate of industrial production, the change in administrative apparatus will also be accelerated to expedite decision making and streamlining financial procedure. Consultancy with the trade unions and managements will be promoted to evolve sound industrial relations and to secure increased productivity consistent with a fair deal to labour.

Understandably, with all this in view, the Presidential Address did not minimise the magnitude of the long and difficult task ahead when it said, "To achieve victory in the war against poverty and social injustice requires sustained and dedicated efforts of the millions of our people." To this the Prime Minister, while replying to the debate on the Address, added without mincing words, "the road ahead is long and full of hardships and those who supported us should be prepared for hard work, for difficulties and perhaps even for dangers." Quite so; what counts in all these spheres is action rather than mere promises on the part of the Government and cherishing of hopes merely to share the rewards on the part of the people. Without themselves contributing their mite to the task of national reconstruction through discipline and self-sacrifice, the people cannot make the developmental works meaningful to themselves. Needless to add that a necessary concomitant of the much talked of equality of opportunity is the sharing of sacrifice which both the partners in a democracy—the people and their Government, must equally make.

In fact, there is nothing very new and radical about these programmes. The Indian people have, in the past two decades or so, been presented with many a slogan which eluded them, often with the result that they grew restive. They, therefore, started indicating their disillusionment and finally registered their resentment in the 1967 General Elections. Despite this forewarning the socialistic pattern and the planners failed to produce any tangible results. It was perhaps due to lack of determination or pragmatism that the socialist goal still remained there to be sought after. However, the situation after the 1971 mid-term poll is unique in as much as the party-in-power, is now in full command of the political and administrative armoury to carry out its programmes of socio-economic transformation. This situation leaves no room for complacency. It is hoped that economic realities will keep the Government on the path of pragmatism and the people poised for hard work—because in the new political equation, the logic of economic realities will equal the logic of power.

URBAN COMMUNITY DEVELOPMENT: A CRITIQUE

G.C. BAVEJA

IN recent years there has been a great concentration of population in urban areas due to the influx of people from the rural areas into cities and towns. India's urban population has increased by about 136 per cent between the period 1931-61, as compared with an increase of only about 46 per cent in the case of the rural population. The increase in the population of metropolitan cities like Delhi and Bombay has been even more marked. For instance, the population of Delhi increased by more than 400 per cent during this period; from only 4.5 lakh in 1931 to 23.6 lakh in 1961, and still further to 36.3 lakh according to provisional census figures of 1971. Indian cities today, staggering under the burden of large populations are, therefore, unable to bring about a corresponding improvement in civic amenities.

Another characteristic of the urban population is its heterogeneous character, with diverse socio-economic background, different values of life and divergent interests resulting in lack of community feeling. Urban areas, particularly metropolitan areas, therefore, require attention not only so far as provision of civic amenities like water supply, sanitation and transport are concerned, but also for the development of community feeling and social cohesion among different sections of the population. The irony of the situation is that while the significance of the former aspect has been recognised both at the official and non-official level, although even here the efforts have fallen much short of the requirements, the latter aspect has not yet received adequate attention. Urban community development continues to be a relatively neglected field of work.

Urbanisation has brought in its wake various complex problems. These problems broadly fall in two categories: those arising from physical environment relate to housing shortage, slums, over-crowding, inadequate water supply and transport, poor sanitation, etc. In the sphere of social environment there are the problems of cultural gap, individualism, juvenile delinquency, crime, mental disorders, alcoholism, bootlegging, prostitution and other forms of deviant behaviour. In western countries, these problems have assumed such dimensions so as to provoke the remark, with Malthusian pessimism, that "population growth and urbanisation can destroy the world". These problems are common to Indian cities also; only they vary in degree and extent. The social and cultural background and the stage of development have given urbanisation in India its own peculiar character, but the core retains the characteristics of the phenomenon as it prevails in the western countries.

The questions that arise in this connection are: How can the community meet the challenge of urbanisation? Is planned urbanisation the answer? Does the problem require a multi-pronged attack? Whatever be the answers to these questions, it is evident that any programme of development to be economical and effective has to utilise the vast potential of human resource. Government and private agencies are fast realising that programmes of development are accomplished at a much lower cost when they take the citizens into partnership. This growing appreciation of public participation has given rise to various experiments in community development, which has come to be looked upon as a major instrument for setting the community on the road to social and economic progress. The approach and emphasis will differ from place to place, but essentially the programme, according to the United Nations Department of Economic & Social Affairs, is made up of two elements. These are: (a) the participation by the people themselves in efforts to improve their level of living with as much reliance as possible on their own initiative; and (b) the provision of technical and other services in ways which encourage initiative, self-help and mutual help and make these more effective.

Urban community development differs from rural community development in many ways, although both emphasise self-help, people's participation, development of local leadership and reliance upon persuasion and motivation, rather than compulsion. The main points of departure are:

- Rural community development places more emphasis on economic improvement of the villages in view of their poverty, whereas urban community development places relatively less emphasis on this, and is more concerned with social aspects of the programme.
- Urban areas have a more complex heterogeneous social structure and the absence of any tradition of working and acting as a community.
- Urban people have more divergent interests, and also less stake in the development of the area on account of the high rate of their mobility.

While the community development programme in rural areas was launched by the Government of India in 1952, community development programmes in various urban centres have been launched from time to time under different auspices.

The first major experiment was initiated in Delhi in 1958 under the auspices of Municipal Corporation with the help of Ford Foundation. This was repeated in Ahmedabad in 1963, again with the joint collaboration of the local Municipal Corporation and the Ford Foundation. The focal point of the programme was

the formation of *Vikas Mandals*, with a number of *Vikas Mandals* being coordinated into *Vikas Parishads*. At the end of the experimental period of three and half years, the Ahmedabad project was abandoned as the Municipal Corporation was not willing to finance it single-handed. In Delhi, the Urban Community Development Department of Corporation has since been amalgamated with its Social Education and Audio-Visual Department.

Urban community development pilot projects were sponsored by the Union Ministry of Health in 1966, which have been functioning under Municipal or State Government Administrations. Of these 20 projects in operation at present, 2 are located in Delhi. The objectives of this programme are similar to those undertaken in collaboration with the Ford Foundation. Each project is designed to cover a population of about 50,000 and is manned by a Project Officer and eight community organisers.

Two major Projects which have been conducted by voluntary bodies and which deserve mention are the Baroda Community Development Scheme and the Tisco Project started with the help of the industrial House of Tatas.

Besides these projects, Urban welfare extension projects were started by the Central Welfare Board in 1958. The programme was mainly intended to improve the lot of women and children in slum areas. Each project was entrusted to a voluntary organisation, which were given a grant of Rs 25,000 each for a three-year period.

Urban *Lok Karya Kshetras* were started by the Bharat Sevak Samaj, with financial assistance from the Planning Commission for the purpose of improving the socio-economic conditions of the slum-dwellers. The financial pattern provided for Rs 7,500 per *kshetra* towards salaries and administration only. Socio-economic activities were to be financed with community effort and local resources and with funds available under normal schemes.

FAILURE OF EXPERIMENTS

These different experiments, even though laudable, have failed to achieve the desired results. This is not due to any major defect in the original concept, but due to various shortcomings in their implementation. Firstly, these experiments have suffered from rigidity in pattern with the result that where initiative has been mediocre they have resulted in only some routine services being established by the organisation without much involvement of the people. It would have been better if instead of devising a unified pattern of welfare activities and staff, a measure of flexibility, either in the approach to, or the solution of, local problems had been permitted. Secondly, there was lack of sympathy on the part of personnel administering these programmes. It is essential that the officials and non-officials administering the programme should be committed to the ideology of work, because only a committed worker will be able to inspire others. Besides, there have been considerable difficulties in recruiting suitable staff. Even where the staff has been recruited, the turnover of staff during the period of the project has not been high, and frequent changes in workers have affected the work

considerably. Thirdly, the projects have suffered from lack of coordination with similar work being done by other welfare agencies. In some cases certain projects have functioned in isolation. To be successful, the concept of coordination has to cover not merely the community development project, but also the whole range of social programmes administered by the Municipal Corporations as well as the various departments of the State and Central Governments. Finally, procedural delays have acted as a brake to projects. In certain cases funds could not be released in time, while in other cases the projects lost matching grants for their inability to keep to the deadline. Rigidity and community development evidently cannot go together, and some means have to be found to introduce a measure of flexibility in the administrative approach.

PEOPLE'S PARTICIPATION

No doubt, one has to appreciate certain inherent difficulties in ensuring people's participation in various community development programmes. It is not easy to have complete rapport between official agencies, because of lack of mutual trust. Also, with the increase in the stresses of modern life, the old concept of voluntary donations or voluntary work is undergoing a change.

Urban community development in India has had a chequered career and its impact has not been as promising as was anticipated. Nevertheless, there is no reason to take a pessimistic view of its future potentialities.

It is necessary to clearly define the relationship between urban community development and the local authorities, and to provide effective coordination between them. There should be a more judicious selection of the activities undertaken under urban community development programme. The entire range embraces improvement of public amenities, health and sanitation, educational programmes, social, cultural and recreational programmes, economic programmes and vocational training. Because of limited financial resources, a selective approach based on careful assessment of needs is essential. In any case, it should be ensured that a larger number of activities are not undertaken simultaneously in the initial stages of the project.

It is essential that the programme should have a built-in system of evaluation in regard to the goals of the project, content of the programme, its organisation and impact and a system of follow-up action on deficiencies noticed during evaluation. The areas which lend themselves to improvement may be preferred to areas which are not making much headway. There is need to lay emphasis on the training and education of officers, voluntary workers and local leaders. The training courses need not be too elaborate and some courses may be of only one to two weeks' duration, according to need, together with a provision for refresher courses. Since this is a new and difficult area, it is necessary for project personnel in different parts of the country to exchange information periodically about the various problems and approaches to urban community development.

WHERE IS ECONOMIC POWER CONCENTRATED?

M. P. SRIVASTAVA

ONE of the objectives of planned economy in India is that there should be "reduction of inequalities in income and wealth and more even distribution of economic power."

We are told again and again that we should prevent the concentration of economic power in the hands of a few individuals. At the same time it is admitted on all hands, that if a nation has to develop its economic life, it must have the spirit of enterprise. No nation can become prosperous without the existence of a vigorous spirit of enterprise which plays its vital role in the development of trade, commerce and industry of the country. The question, therefore, is: "Does free enterprise create monopoly?" No doubt it is private enterprise that built up a number of industries during the last few decades. It is responsible for the present happy position of the textile, jute, silk, rayon, cement, sugar, shipping, automobile and such other industries.

It has been said that India welcomed individual enterprises. At the same time it is pointed out that "free enterprise means creation of monopoly which prevents others from progressing, unless they come under the shadow of that monopoly."

It is accepted that private enterprise assures maximum economy and most efficient management or utilisation of resources, whether in a large or small unit. In this lies its main merit. What is wrong, therefore, is not the existence of private capital or enterprise by itself. Its main fault lies in situations where there is (a) maximisation of private profits without maximisation of output, and (b) utilisation of private profits for the benefit of a few or their allocation contrary to the needs of society.

Safeguards have, in all cases, to

be adopted against profiteering and misuse of profits. First, there is profiteering or maximisation of output because of the monopolistic nature of the market for a commodity. Hence the Government will have to be vigilant in breaking and preventing all forms of monopolies. The latter should, however, be not confused with the size of an enterprise, which may have to go on increasing in certain branches of industry to accommodate technical progress and to derive maximum economies of scale. Secondly, private profits may be earned simply by raising prices through curtailment of output and supplies. Such practices as hoarding, cornering, speculation, etc., have to be weeded out through appropriate measures. Thirdly, profits may be made, not through economy in the use of resources and efficient management but by an unfair practice. In other words, unscrupulous private capitalists may maximise their gains through dishonest practices. Adequate institutional controls and honest administration are, therefore, necessary to safeguard against such malpractices. Fourthly, if private capital happens to own or dominate the core of the economy that supplies inputs to the rest of the economy it may arrest the economy by raising input prices restricting supplies to maximise its profits. A socialistic economy demands an ever-expanding core, comprising of heavy and basic industries. Finally, in a modern economy little can be produced without adequate finance provided by the banking and non-banking financial institutions. Hence their efficient working in the social interest rather than in the interest of private owners of capital, is most essential.

The Third Plan pointed out that the tendency towards concentration of economic power has to be countered in a variety of ways: first,

through the extension of the public sector into fields requiring the establishment of large-scale units and heavy investments; secondly, through widening opportunities for new entrants, and for medium and small-sized units as well as for industries organised on cooperative lines; and thirdly, through effective exercise of Government's powers of control and regulation and use of appropriate fiscal measures. The object, the Plan categorically stated, must be not merely to prevent concentration of economic power and the growth of monopolistic tendencies. The ultimate aim should be to promote a pattern of industrial organisation which will lead to high levels of productivity and, at the same time, give full scope, within the framework of national planning, to new entrepreneurs of medium and small-scale enterprises, and to cooperative organisations.

Industrial Licensing Policy

To counteract the concentration of economic power in the established private sector, new industrial licensing policy needs to be carefully examined. The main elements of the new policy are:

(a) The definition of small-scale industry is maintained, and some more items (steel furniture, cycle tyres and tubes, mechanical toys, aluminium utensils, fountain pens and ball-point pens, electric horns, toothpaste, hydraulic jacks below 30 tonne capacity) have been added to the list of industries reserved for this sector.

(b) The cooperative sector is to be favoured for agro-industries (cotton and jute textiles, sugar).

(c) The exemption limit for licensing has been raised from Rs 25 lakh to Rs 1 crore; but units belonging to the 20 large houses, subsidiaries and branches of foreign companies, and units with assets of Rs 5 crore, are required to take out a licence even in this category.

(d) The larger houses are not precluded from the heavy investment sector (involving capital investment of Rs 1 to 5 crore), but preference in this sector would be given to units outside the larger houses.

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REGIONAL DISPARITY:

A Case Study of Pakistan

The growth rate in East Bengal was as low as 4 per cent per annum during Pakistan's Third Plan period as compared to 6 per cent per annum in West Pakistan. Also, the eastern region's share in the gross domestic product showed a declining trend during the Third Plan. This economic imbalance, largely man-made, is one of the more important reasons for the unhappy developments in Pakistan's eastern wing.

G. D. MATHUR

THE most important problem faced by planners in Pakistan has been the economic disparity between East and West. In the matter of resource allocation, the First Five Year Plan took into account the extent of regional disparities between the two wings and decided to increase the rate of development in East Bengal. This objective was reaffirmed in the Second Plan. Despite this, the rate of development in East Bengal was quite below expected level. Though the absolute share of public expenditure was increased considerably during the Second Plan as compared to the First Plan, the relative share of the East was reduced from 46.9 per cent in the First Plan to 45.9 per cent in the Second. In the revised estimates of the Second Plan it was further reduced to 43.7 per cent.

Basically, the economics of both the regions were, 'primary agrarian', but after ten years of planning (1950-60) the West emerged relatively more industrialised. Punjab and Sind have shown a rather faster rate of industrial growth. There, large scale industries formed 72 per cent of the industrial sector and only 33 per cent of the exports consisted of primary goods. The situation was quite different in East Bengal.

The following table show the differences.

During the first two plan periods, the location of the expanding industrial capacity took place in a haphazard and unplanned manner. The private sector, which played quite a significant role in the industrial development of the country, preferred either Karachi or Lahore in West Pakistan because entrepreneurs expected to enjoy a

number of economic concessions and other advantages from the administration. The establishment of public sector plants also had the same story. Social and political considerations outweighed economic considerations and a number of industrial units were established at most uneconomic locations, at places like Harnai, Lawrencepur, Bannu, Quetta and Haripur, all in the Western wing.

Exports

There has been a much larger amount of export from West Pakistan to East Bengal. During the seven year period from 1948-49 to 1954-55, West Pakistan exported goods worth Rs 181.12 crore to East Bengal whereas East Bengal exported goods worth Rs. 69 crore only to West Pakistan. This resulted in a favourable balance of trade of Rs 112.2 crore in respect of West Pakistan.

About 70 per cent of Pakistan's large scale industries were established in West Pakistan during the 'fifties. The rate of expansion of cotton textile mills was much faster in the West than jute mill expansion in the eastern wing. Similarly the rate of increase in the capacity and output in manufacturing and mining industries was much faster in West Pakistan than in East Bengal. In the East, only paper and allied industries could develop during those 10 years where

	1951-52		1959-60	
	E. Bengal	W. Pak	E. Bengal	W. Pak
1. Agriculture as per cent of regional Income	68	50	65	46
2. Industry as per cent of regional Income	7	8	10	15
3. Exports as per cent of regional Income	12	10	9	6
4. Primary Exports as per cent of total exports	100	86	70	33
5. Large Scale industry as per cent of Industrial Sector.	15	41	43	72

Source: Mahbub-ul-Haq : A Strategy of Planning

as in West Pakistan basic chemicals, pharmaceuticals and cement industries were established as a base for development.

In the Second Plan (1960-65) special importance was attached to the development of power, irrigation transport and drainage and flood control in the Eastern Wing, but they in no way reduced the disparities but further accentuated them. Large scale industry in West Pakistan made a contribution of 15.5 per cent to the gross regional product during 1964-65 as against 5.5 per cent contribution made by East Bengal.

During the Third Plan period Pakistan registered an increase of 31.6 per cent in its national income which increased from Rs 4,105 crore to Rs 5,403 crore. Although it was a creditable performance for the economy, the regionwise performance of the West was much higher than that of the eastern counterpart. The gross national product of West Pakistan grew from Rs 2,179 crore (1965) to Rs 2,937 crore (1970) registering an increase of 34.8 per cent as against an increase of 22.1 per cent only in East Bengal where the gross national product could increase only to Rs 2,194 crore from Rs 1,797 crore. Similarly, the quantum of investment as a percentage of regional GNP was much higher in West Pakistan as compared to the Eastern wing. The regional investment as a percentage of regional GNP in West Pakistan during 1964-65 was 23.6 per cent as against 10.7 per cent in East Bengal. After five years, the percentage of regional investment to regional GNP was 15.1 per cent for West Pakistan while it was 11.6 per cent for East Bengal during 1969-70. This shows that in West Pakistan the total investment in the economy was at a higher rate as compared to East Bengal during the Third Plan period.

The growth rate in East Bengal was a low 4 per cent per annum during the Third Plan period (1965-70) whereas it was 6 per cent per annum during the same period in West Pakistan. Also, the eastern region's share in the gross domestic product of Pakistan showed a declining trend during the Third Plan. It came down from 43.8 per cent in 1964-65 to 40.6 per cent in 1969-70, whereas the con-

Year	East Bengal's earnings (Rs crore)	West Pakistan's earnings (Rs crore)	East Bengal's Share in the total earnings.
1960-61	125.9	54.0	70%
1961-62	130.1	54.3	70%
1962-63	124.9	99.8	55%
1963-64	122.4	107.0	54%
1964-65	126.8	114.0	53%
1965-66	151.4	120.4	55%
1966-67	166.0	132.5	56%

tribution of West Pakistan to the GDP of Pakistan showed a consistent rising trend.

Agriculture

The rate of development of agriculture in East Bengal during the Third Plan period was a static 3 per cent which barely kept pace with the rate of growth in population. On the other hand, the rate of agricultural development in West Pakistan during the same period was 5.55 per cent, more than 100 per cent the rate of population growth.

As already pointed out, the quantum of private investment was higher in West Pakistan as compared to East Bengal due to subsidies, concessions and other incentives provided by the National Government. The sanction of capital issues for big industrial projects was more than 300 per cent in West Pakistan which stood at Rs 816 crore as compared to only Rs 294 crore in East Bengal between 1961-69.

Between 1952 and 1968, East Bengal with its export of jute and black tea was in a dominating position vis-a-vis West Pakistan as it had earned a cumulative export surplus of Rs 951 crore. The export surplus for West Pakistan during the same period was Rs 400 crore. After 1968 the position was reversed.

The production and export of tea and jute declined. The production of jute came down from 68.42 lakh bales in 1947 to 63.64 lakh bales in 1967. Similarly, tea fetched foreign exchange worth Rs

5.58 crore during 1954-55 but this income was reduced to a trickle, to Rs 1.1 crore, by 1965-66. The findings of a report on inter-regional and intra-regional disparities published in December 1967 by the Government of Pakistan clearly prove that the policy adopted by Islamabad has helped West Pakistan economically at the cost of East Bengal. The above table shows export earnings of East Bengal and West Pakistan during the period 1960-67.

The total regional income of West Pakistan was lower than that of East Bengal in 1947 but the tables have been turned and West Pakistan's regional income now stands 25 percent higher than that of East Bengal.

Relief works in Scarcity Affected Areas

Our Bombay Correspondent

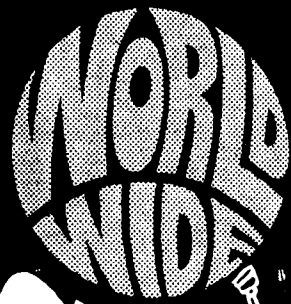
The Maharashtra Government has sanctioned famine relief works to the tune of Rs 2.32 crore in scarcity affected areas in 20 districts of the State. It has been estimated that over nineteen thousand villages have been facing scarcity conditions this year, affecting about two crore people.

The Central Government has been requested to sanction Rs 20 crore as ways and means advance under which head Rs 4.5 crore have already been sanctioned. The farmers' taccavi loan needs are estimated to be around Rs 12 crore.

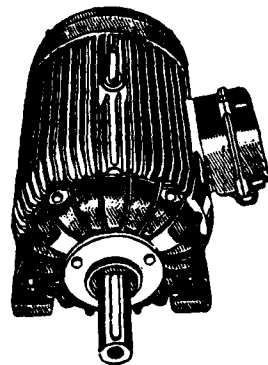
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KAMANIS

BUILD

NEW TV

TOWER

In the heart of New Delhi, and towering above the many buildings within sight, is Delhi Television Centre's new TV tower. A fresh addition to the Capital's changing skyline, the tower is painted a glowing white and 'International Orange'. A new antenna mounted on this 100.5 metres high structure will carry telecasts to a radius of 60 kms., with improved reception to TV owners. Costing Rs 3.5 lakh, the tower was designed, fabricated and erected by the Kamani Engineering Corporation and will be commissioned by the end of May, 1971

A Yojana Staff Report

by

SIDDHARTHAN KARIYAL

ALTHOUGH TV towers of this type are non-news to other parts of the world where TV is merely an idiot-box, to India it means much. Soon, at Arvi, Srinagar and Bombay, the Delhi tower will have its brothers and technology's most potent medium of communication will add its impetus to the task of development.

To the Delhi Television centre itself, the tower means an increased radius of reach, from 40 kms. of now to 60 kms. of line of sight. To the city's TV owners it means elimination of reception snags like multiple images and rolling.

Kamanis, the engineering company specialising in the design and

fabrication of transmission line towers and sub-station structures, are the world's second largest (second only to SAE of Italy) company of its class. Despite this, they had to battle against many odds to win a 500 kV transmission line tower order from the US utilities firm, Central Louisiana Electric Company.

At first, sometime in 1968, this firm disdainfully refused even to give the Kamanis their specifications and other details relating to the global tender. Up against a wall of irrational prejudice, the Kamanis were helpless. But not the second time. The next occasion Central Louisiana was in the world market for transmission line towers, Kamani salesmen were "ready for the kill". Armed with laudatory certificates and letters of appreciation from satisfied customers in South-East Asia, Africa, Middle East and the World Bank, (under whose aegis development projects were undertaken in these regions), they convinced the American buyer about their ability to deliver the goods,—in time and fully in conformity with any standards they would prescribe. A visit from an inspection executive from the utility firm's consulting engineers to Kamani's works at Kurla followed. There, they had a trump up their sleeve: extensive testing facilities that would ensure any internationally recognised standards to their products. This is what the American, Lloyd W. Wilson, Construction Management Director of the consulting firm, Commonwealth Associates, Inc., Michigan, recorded after the visit:

"Their (Kamanis') success demonstrates what can be accomplished if there is a strong desire to succeed."

Driven by Necessity

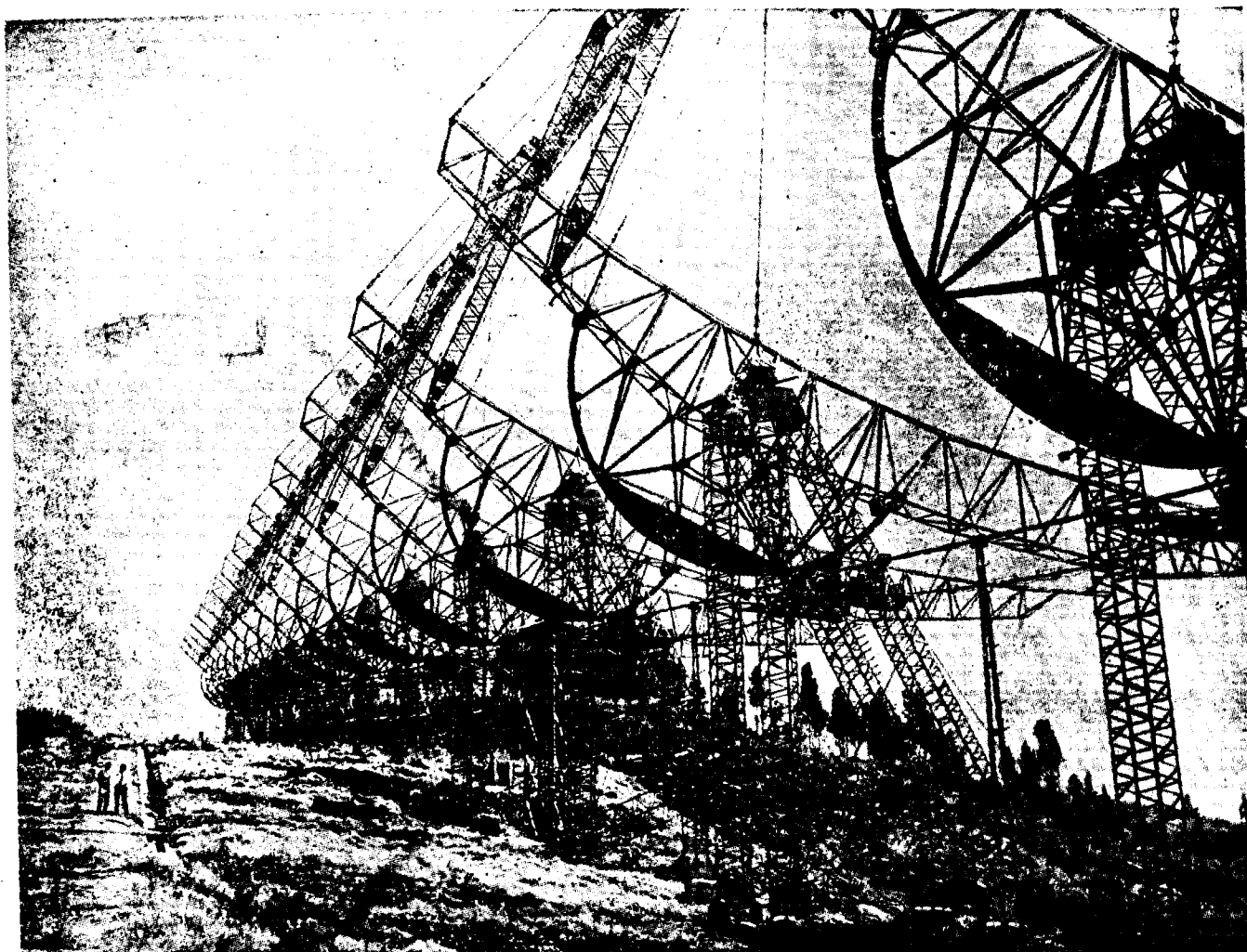
Ironically enough, Kamani Engineering Corporation had perforce to acquire this desire to succeed in the merciless world of international competition out of necessity created by the recession of the late 'sixties. Saddled with an annual 60,000 tonnes manufacturing capacity, they were hard hit by the slump. The situation really had become one of "export or perish". The Government's decision to supply steel at international prices for manufacturing against export orders helped.

But, to enter world competition, Kamanis had to develop the know-how to erect transmission towers for 330 kV and 500 kV lines, much beyond their experience in India which never went above 220 kV. But more than anything else, it was the dogged perseverance of men like V. Kothary, an engineer the Kamanis had despatched to the US to set up an office at New Orleans to smell out trouble and shoot it whenever it occurred, that really won the game for the firm. Kothary saw to it that his structural steel sections were properly treated with dichromate, protected from hail, storm and rain and from dockyard scratchings and rubbings. And when these occurred on rail delivery, he shipped the material by trucks.

A Precision Job

With a quarter of a century of experience behind them in their specialised field of construction, Kamanis were awarded the prestigious contract to build India's first TV transmission antenna tower in the Akashwani Bhavan complex on New Delhi's Parliament Street. Towering more than a hundred metres above Akashwani Bhavan and Broadcasting House, the tower, painted an arresting white and red ('International Orange', they call it; the zebra markings conform to world aviation's daylight obstruction regulations), is a new landmark in the Capital. It is several feet taller than the famed Qutb Minar. Rising as it does in the very heart of the capital (a stone's throw from Parliament House), Kamanis' design engineers had earlier submitted several designs, combining functionality with structural aesthetics. Out of these, the most pleasing design was selected, and today, the finished tower's proud crest becomes another feather in the Kamani cap.

Bolted into position by a score of itinerant semi-skilled labourers from Kerala and Tamil Nadu, the tower is something of a precision job. The holes for several thousand nuts and bolts on hundreds of precisely cut steel sections were programmed by Kamanis' Computer Cell.



A view of the 530 metres long radio telescope located at an altitude of 2,200 metres at Muthuria near Ooty, in the Nilgiris. Each of the 24 frames is 30 metres wide; the frames can be rotated in unison by 140°. Photography by T. Koshi Nath, Photo Division.

OOTY TELESCOPE TO DISCOVER NEW PULSARS

India is among the half-a-dozen countries of the world today actively engaged in finding out more about pulsars, quasars and other mystifying things. Expensive though the effort is, it is not all extravagance.

The knowhow perfected for the construction of the new Radio Telescope at Ooty, for instance, has already helped the country in developing micro-wave antenna systems and electronic receiver systems. The telescope is a powerful facility in a frontier field of science.

GOVIND SWARUP

THROUGH the ages man has looked out at the Universe around him and studied it with his eyes, and with the help of instruments such as sextants and optical telescopes. In 1931, Carl Jansky discovered that there were also radiations in the radio region from outer space that he could identify as coming from specific regions such as the Milky Way. With this discovery was opened a wide new window into the Universe—the window of Radio Astronomy.

A radio astronomer studies the Universe using radio waves, instead of the light waves used by the optical

astronomer. Radio waves, like light waves, are electromagnetic in nature. Light from stars and galaxies generally originates from hot gases at temperatures of about 6000° to 20000° K. But radio waves arise differently. They are emitted by highly energetic particles as they move with velocities close to that of light in the presence of magnetic fields. These natural radio waves produce a hissing type of noise when received by a radio telescope. With the help of a directional antenna, or a radio telescope, the strength and direction of radio waves received from different parts of the sky can be determined and a map of the radio sky prepared. It should be pointed out that just as there are stars which are visible, there are discrete radio sources or radio galaxies that can be 'seen' through radio waves with radio telescopes.

Vast Explosions

Studies of distant radio galaxies and quasi-stellar objects (quasars) have provided evidence of vast explosions occurring in distant parts of our Universe which give rise to highly energetic particles. It appears that powerful explosions occur in some galaxies as a result of which matter more than a million times the mass of the sun is completely converted to energy. The energy released is truly fantastic. Many theories have been propounded, but the mechanism of these violent events is little understood.

Radio astronomy has yielded spectacular results over the past four decades of its existence. The past decade especially has seen some of the most exciting discoveries ever made through this window. These discoveries relate to quasars and pulsars, the existence of the universal micro wave background radiation, the opening up of maser astronomy with studies of the hydroxyl (OH) molecules, and evidence of the existence of molecules as complex as ammonia, water and formaldehyde in the outer reaches of space.

In India, radio astronomers have been provided a new tool for studies in this frontier field of science. At Ootacamund in the Nilgiri Hills, one of the most powerful radio telescopes in the world was commissioned in February last year. Desi-

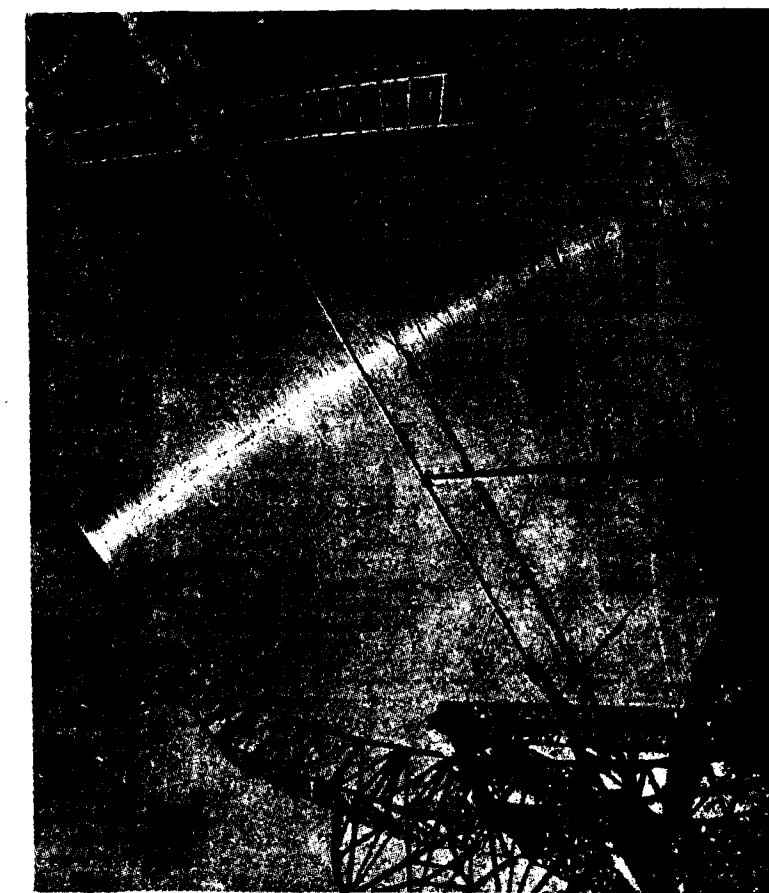
gned and built wholly by Indian scientists and engineers under the aegis of the Tata Institute of Fundamental Research, Bombay, this advanced instrument provides Indian scientists opportunities of working at the very limits of man's endeavour in this area.

Novel Design

The Ooty radio telescope has a special design which utilizes the location of India near the geographic equator; this design provides for large gathering power and also sufficient steerability at a relatively low cost. The instrument has a reflecting surface which is 530 m long and 30 m wide. It is about 4 times more sensitive than the 250 ft. (approx 76.2 m) dish at Jodrell Bank, England; but it is not a general purpose instrument like the latter as it operates in a fixed radio band of 324-329 mega-hertz only. A radio telescope primarily consists of a large surface on which the radio

signals coming in from outer space can be reflected and brought to a focus at a point or along a line; from the focus, the signals are carried to a receiver system where they can be recorded and analysed. The most familiar design of a radio telescope is the deep saucer-like dish such as the dish at Jodrell Bank in England; such a dish is fully steerable and can be pointed in any appropriate direction; it can be rotated along two axes that are at right angles, and can thus follow a star or galaxy during its motion across the sky.

The Ooty radio telescope uses a novel design. Its surface is in the form of a parabolic cylinder—like that of a long trough with a parabolic cross-section. Such reflectors provide large sensitivity or collecting area at a relatively low cost; they have been built elsewhere in the world, but they are not steerable in the east-west direction and so they cannot be used for tracking or following radio sources for more



The streak of light is from the fine stainless steel wires, 1,100 in number, forming the reflecting surface of the telescope.

than few seconds a time. Utilizing India's proximity to the geographic equator, we have installed a 530 m long trough type reflector with its axis in the geographic north-south direction on a slope of 1124°, this angle of inclination being equal to the latitude of the station. Thus the axis of the instrument is kept parallel to the earth's axis of rotation. This arrangement enables us to follow radio sources in the east-west direction for 9½ hours per day by a mechanical rotation of the reflector along its long axis. The beam of the radio telescope, or the direction in which it is looking, can be moved in the north-south direction by changing the lengths of inter-connecting transmission lines. Thus, by mechanical rotation in the east-west direction, and by electrical phasing to obtain beam movement in the north-south direction, the telescope achieves steerability.

Parabolic Frame

The telescope is located on a hill that has a slope of about 11°. On this slope there are 24 equidistant, tall steel towers; and on top of these is mounted a parabolic frame; the two ends of each parabolic frame are 30 m apart. The 24 frames span a horizontal distance of 530 m. These frames are connected together by 1100 stainless steel wires, each 530 m long. The wires are parallel to one another and constitute the radio reflecting surface of the telescope. Radio waves incident on the surface are reflected on the 968 radio dipoles placed along the focal line of the telescope and thence carried to a multi-beam receiver providing 12 simultaneous beams in the sky. The entire 530m by 30m surface can be rotated in unison through an angle of about 140° using complex electrical and mechanical fixtures all designed and fabricated in India.

The cost of a parabolic dish with the same sensitivity and steerability as the Ooty Radio Telescope is estimated to be at least 20 times higher. An array consisting of a large number of smaller size dishes would also cost very much more. But in contrast to a parabolic dish, the parabolic cylindrical reflector of the Ooty Telescope can be operated at only one or two fixed radio bands.

The design of the Ootacamund

Radio Telescope was conceived to enable study of distant radio galaxies by the method of "Lunar Occultation". As the moon moves in the sky, its sharp edge eclipses radio waves from a distant radio source. A narrow source goes behind the moon's limb suddenly but a broad source disappears gradually. As the moon moves away, the source emerges again. A record of this phenomena allows a very precise pin-pointing of a radio source and also provides information about the shape of the radio source. This technique is extremely powerful and gives resolution of better than a second of arc; it has not been exploited fully so far because of the lack of a sufficiently large and steerable radio telescope in any part of the world.

At Ooty, during the first 14 days of operation, occultation observations of 16 radio sources were made; 11 of them were objects which were catalogued by other observatories, but for which detailed structure data was not available; 5 of them have been detected by us for the first time. So far astronomers have catalogued more than 15,000 sources but detailed structure with resolution of few seconds of arc is available for only about 30 comparatively strong sources. With the Ooty instrument we expect to observe several hundred new sources every year with resolution of about 1 second of arc. These observations will be compared with photographs taken with the 48" (approx. 1.2 m) telescope of Mt. Palomar Observatory to find the nature of associated optical emission. It is also planned to study the same objects with the new 48" (approx. 1.2 m.) telescope at Rangapur of Osmania University, near Hyderabad and with the 40" (approx. 1 m.) telescope being installed at the Kodai-kanal and Nainital Observatories. The data will be used for studying the origin and evolution of radio galaxies. Studies of very distant and consequently weak radio galaxies lying on the edge of the universe is likely to be highly significant for cosmological problems relating to the nature of the universe.

It is also planned to undertake a survey of weak radio sources in the southern hemisphere and to measure the declination of some of

the already catalogued radio sources by other observatories. The instrument will also be available for galactic objects, studies of radio emission from planets (particularly Jupiter), flare stars and the sun. We may in addition undertake measurements of deuterium to hydrogen ratio because of the considerable astrophysical significance of the problem.

A major programme has been started for detailed studies of the recently discovered pulsating radio sources (pulsars). These sources emit pulses of radio emission with a period accurate to one part in a million. So far only 50 pulsars have been detected by radio astronomers with periods ranging from a fraction of second to a few seconds. It is believed that pulsars are associated with highly compact neutron stars which have densities of about billion times that of the earth and which rotate roughly once a second. Our instrument at Ooty is well suited to study them in detail and perhaps also for discovering many new pulsars. It represents a major facility in a frontier area of science. It can make a significant contribution to the training of young scientists in the country, who will either be able to use it for advancing fundamental knowledge in the areas of astrophysics and astronomy, or through their training, contribute to the country's needs involving large antenna systems and associated electronics.

—Courtesy, 'Nuclear India'

COCHIN REFINERIES PAY DIVIDEND

Cochin Refineries Limited, a company in the public sector, has paid Rs 68.78 lakh to the Government of India as dividend for the year 1969-70.

The Company has an equity capital of Rs 7 crore, in which the Central Government's share is Rs 3.7 crore, i.e., 52 percent. This year's dividend, therefore, means a return of 18.5 per cent to the Government. In addition, the Government has earned Rs 7.39 crore in the form of non-recoverable duties which, incidentally, are not passed on to the consumer.

The refinery has been on commercial production for the last four years only.

Indian Technologists Invent

New Film Projection and

Processing Techniques

India is the second largest producer of feature films, turning out almost one film a day. Yet, our film production has always been dependent on imported technology. However, recently some significant advances have been made in the realm of film technology in our country. These include the mirror screen arrangement and the new film printing and processing machines.

A YOJANA STAFF REPORT

BY

AVINASH GODBOLE

Our Bombay Correspondent

It is a common experience that audience sitting far away from the screen in a theatre have a comfortable vision of the film, but, to those sitting close to the screen in lower stalls the images on the screen look somewhat distorted. It affects eyesight.

To remove this and other handicaps in the current film projection technique, a professor from Bombay, Dr C.R. Marathe has invented a new film projection technique, known as the mirror screen arrangement.

Everybody knows that an image of any object placed in front of a plane mirror appears as far behind in the mirror. Dr Marathe has made skilful use of the properties of the translucent screen and of the plane mirror in his new method to give

clear, bright sharp vision of the film even to those who sit in the lower stalls in the cinema houses.

In the current projection method, when pictures are projected on one side of a translucent screen, the other side also gets illuminated. The illumination on the side facing the screen is called front illumination and that on the other back illumination. If the screen material is white and suitably translucent the back illumination can be made as bright, sharp, clear and coloured as the front illumination. Dr Marathe has achieved success in this aspect, and has been successful in projecting lateral inversion reflected on the back side of the screen into an exact replica of the front illumination through his mirror screen arrangement.

In the new method, a film is not only screened on the regular screen, but by placing a mirror, in fact a mirror like reflecting surface, in front of the back illumination of the translucent screen at a suitable distance, the back illumination is also screened on a reflector. Thus the new method provides two auditoria, or two screens, in the theatre with one projector. One auditorium is served with the regular screen and the other with the reflector screen in which the audience sees the image of the picture. Dr Marathe says that the new arrangement can be introduced in the existing cinema houses with minor readjustments.

The main advantage of the new method is that in the regular screen area the viewers get more bright, sharp, clear and comfortable vision, because the screen is nearer and so placed that the angle of vision remains in a suitable range from any seat in the auditorium. At the same time, in

the other auditorium, with reflector screen, the reflecting surface is placed at such a suitable place that the mirror screen goes sufficiently behind reflecting surface, giving first class vision to the audience seated in that auditorium also.

Moreover, as the image is reflected in the mirror screen far behind the surface, it eliminates the need to keep a big area vacant between the screen and the first rows of seats as in the existing theatres. The elimination of the vacant area, known as the screen clearance area, in the new arrangement helps to increase the seating capacity in the theatres by 30 per cent. Mirror screen arrangement is an entirely new device developed for the first time in the world, according to Dr Marathe.

Yet another film technologist from Bombay, Mr Krishna Gopal has achieved success in manufacturing various parts and equipment for film processing laboratories in the country. As early as 1938 he had produced the first black and white processing unit. It was the first of its kind made in India. Again it was Krishna Gopal who in 1949 fabricated India's first colour processing machine. Now almost all the major film processing laboratories in India are using colour processing machines designed by Krishna Gopal. In 1966, he produced India's first film printer. He has recently put out Mark II of the printer. The original printer was what is known as "subtracting" type and the new one is of "additive" type, which is more compact, thereby making it useful both for black and white and colour printing. The printer can be used for both sound and picture printing simultaneously.

INDIAN MOTOR PARTS FOR UAR

The first consignment of parts for new lorries to be assembled by a UAR Company in collaboration with TATA of India has reached Cairo. This consignment would be sufficient for the production of 120 lorries. The agreement provides for the production of one thousand lorries annually as from March 1972.

what next



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dayp 10/791

A STORE-HOUSE OF KNOWLEDGE

THE U.S. Library of Congress in Washington, with its collection of 60 million pieces and its seven-day-a-week service to the public day and night, plays a role the scope of which could not have been foreseen by its founders 170 years ago. The ornate structure which houses the Library stands alongside the gleaming white building of the Supreme Court of the United States. Built during the 1890's to store material that outgrew its original facilities in the Capitol, the Library has played numerous roles over the past years—as one of the three national libraries and research centres; as a combination museum—gallery-archive, and as a hub of cultural activities.

The latest annual report of the Library reveals a host of projects, including overseas operations, services to the blind and preservation of maps and other items. During the fiscal year July 1, 1968 to June 30, 1969, the Library acquired 367,156 new books and pamphlets, more than 13,000 reels of newspapers and microfilm and some 467,000 manuscripts. The Library has over 29 million manuscripts, about 14.5 million volumes and pamphlets and more than three million maps.

Created in 1800 by an Act of Congress, the Library has its primary responsibility the providing of reference and research data to the member of the Senate and House of Representatives. In addition to acquiring and organizing the materials, the Library conducts research on legislative issues for individual Congressmen and Congressional Committees. The Congress, in turn, shares the material with the public, with the other branches of the Federal Government and with the State governments. In 1901 the Congress authorised a distribution service for the Library's printed catalogue cards, and the institution now serves as a cataloguing and bibliographic centre for private, municipal and academic libraries across the nation. Cataloguing in-

formation is now being transferred to computers.

As one of the three national research centres—the others are the National Agricultural Library and the National Library of Medicine—the Library of Congress offers direct service to the public. One need not apply for membership to use the research facilities.

In 1962, the Library initiated one of its most ambitious projects, the overseas operations. Using funds available under U.S. aid programme involving sales of agricultural products in other countries, the Library began acquiring books, periodicals and documents from India, Pakistan and the United Arab Republic for designated American libraries. The money was also used to pay local staffs in the first two offices, established in Cairo and New Delhi. The programme has been extended to Israel, Indonesia, Nepal, Ceylon and Yugoslavia. More than 40 private and public libraries across the nation participate in the project.

One of the more important roles of the Library over the past century has been as registrar of creative work in various fields—literature, motion pictures, music, advertising



IGNORAMAN

*Wants To Know
If
the word ping-pong
has some other meaning
in Chinese dictionary.*

and art—for copyright in the United States.

The copyright registration function was centralised in the Library in 1870. Over the years, it has grown, as has the copyright office, to deal with the substantial increase in number of items submitted for registration. During the fiscal year ending June 30, 1969, nearly 327,000 applications and documents were submitted.

Works deposited in the copyright office may be selected for the Library's collections.

"A Nation Moving Ahead"

The *Journal of Commerce*, one of America's leading business newspapers, has praised India as "a nation moving ahead". In a special 24-page supplement brought out in March, it carried more than thirty special feature articles and news stories highlighting India's outstanding progress in many areas of development. The subjects covered were export expansion, particularly in relation to engineering and industrial products, improved investment climate, plans for port and transport progress, the status of traditional exports such as tea, cotton, coal and jute, and of relatively new areas of advancement such as tourism and telecommunications. Articles also focussed attention on problem areas such as the protein gap in food production and excessive population growth.

A special article expressed the view that the investment climate in 1970 was the best in four years and that indicators hold promise of larger injections of capital into industry and increased industrial output in 1971.

"OUR PROBLEM IS NUMBERS"

World Health Day on April 7, 1971, marks the anniversary of the coming into force of the Constitution of the World Health Organisation (WHO). Each year a special theme, of importance to a large number of countries, is chosen. The theme for this year is "A full life despite diabetes".



DIABETES IS QUITE COMMON IN INDIA

K. FRUCHT

DIABETES is as common in India as in other parts of the world. However, no clear epidemiological delineation of the problem could as yet be undertaken. It is estimated that the incidence of diabetes varies from one per cent in the general population to seven per cent among office-going adults.

The disease had been recognised since ancient times. The Indian physician Charaka, living in the second century A.D., has mentioned in his compilation "Charaka-Samhita" the sweetness of urine in addition to the symptom of polyuria. Another Indian physician, Sushruta, described in 500 A.D. the disease as *Madhumeha*—passing honey urine—with symptoms of thirst, foul breath, voracious appetite and languor. But in succeeding centuries other, more serious public health problems overshadowed the dangers from diabetes, and the need for treatment was ignored.

As if to make up for the long neglect of dealing with this disease, Professor Hari Vaishnava, Head of the Department of Medicine at the Maulana Azad Medical College and Associated Hospitals, New Delhi, is attacking the problems of diabetes with a brilliant mind and an overwhelming dynamism. Accompanying him on his round through the Metabolic Clinic at the Irwin Hospital can leave a visitor breathless.

← A diabetic has to undergo periodic medical check-up

Professor Vaishnava estimates that in New Delhi alone, out of a population of about three-and-a-half million, 60,000 persons suffer from diabetes; but only a fraction of them apply for treatment. At present 300 to 400 old and new patients—some of them coming from as far as 200 miles—attend the weekly clinic, with the number of new patients rapidly increasing.

"Our problem is numbers" Professor Vaishnava explains pointing at the crowded waiting room. Some of the patients have attended the clinic for many years, in bi-weekly visits, to obtain oral drugs or insulin or to undergo periodic check-up. New patients are instructed in the self-administration of drugs and in the dietary rules and exercises they have to observe.

Socio-Economic Background

"Most of our patients come from a very poor socio-economic background. This means that in almost 90 per cent of cases, drugs and treatment have to be provided free of charge. When the clinic started, nine years ago, this was fairly easy to do from our own resources. What happened in fact was that all the rich diabetics were 'fleeced'. They were requested to instruct their chemists to provide us with insulin and other drugs for the poor patients. This custom still continues, but since 1966 the hospital is expected to provide the needed pharmaceuticals, otherwise we couldn't cope with the addition of approximately 50 new diabetic patients every month. This increase in patient load is due to the fact that we have become known for service. Those suffering from diabetes became aware that they can receive guidance from this clinic, free treatment and drugs, and there are not too many other places they could turn to. It is only natural that ordinary citizens and doctors alike should serve as best as they can to alleviate the lot of the destitute diabetic patients who come to this or another clinic."

While in the developed world the ratio of known to unknown diabetics is one to one, the ratio in India is one known diabetic to 10 unknown ones. Another startling figure is that which illustrates the high incidence of tuberculosis among diabetics. It is five times higher than the incidence

among the general population who are not affected by diabetes. The most frightening finding of Professor Vaishnava, however, concerns the fact that in India nearly ninety per cent of the young diabetics die within five years from the onset of the disease merely for lack of insulin.

A study of the underlying causes of death in diabetes mellitus, conducted at Irwin Hospital by Professor Vaishnava (and one of the first ever undertaken in India), covered the period from 1963 to 1965, and investigated 891 hospital admissions due to diabetes, 122 of which resulted in death. An analysis of the causes of death revealed the following: diabetic coma (32%), renal diseases (15.5%), ischaemic heart disease (13.9%), cerebrovascular accidents (12.3%), diabetic gangrene (8.2%) and others (18.1%). The high figures due to diabetic coma and gangrene are mainly attributed to the inordinate delay in seeking admission to hospital.

The incidence of ischaemic heart disease among Indian diabetics is generally lower than among diabetics in the Western countries. Also ketosis—a condition of the human body marked by excessive formation of carbon compounds such as found in sugar—is accepted to be much less common in cases of diabetes in the tropics than among diabetics in the West although the diet of the general population in the tropics is usually poorer in calories and proteins, and richer in carbohydrates. Indian vegetarians in particular consume a diet which is very rich in carbohydrates, moderate in fats, and low in proteins as compared to Western standards because their diet chiefly consists of cereals like wheat, rice and dal. Carbohydrate intake is still higher among South-Indian vegetarians since rice, which contains as much as 82 per cent carbohydrate, is their staple diet.

Dietary Problems

Regarding dietary problems of diabetics in India, Professor Vaishnava said: "You know what a diabetic would eat in a European country. He can easily increase his protein intake and reduce considerably his intake of carbohydrates. Not so the poor Indian diabetic. As a result of experimentation, we

give him a certain latitude. He can take up to 60 per cent of carbohydrates provided he avoids concentrated carbohydrates like in sugar, sweets, honey and soft drinks with high sugar contents. You might not realise what great sacrifice this means for an Indian diabetic. Sweets are offered on all festive occasions, during the many religious celebrations as well as at weddings and other social gatherings. The temptation is often unsurmountable. But what makes the prescription of a strict diet more difficult is the fact that medical practitioners in this country do not always agree with each other, or with current scientific findings. In Punjab they will say Bengal gram should be eaten instead of wheat, while in Madras they'll tell you to eat wheat but no rice. Yoga people make a tall claim in the treatment of diabetes by exercises. I don't. It's all the same..."

Professor Vaishnava is quite dissatisfied with the time allotted in the nearly one hundred medical schools in India to the teaching of the diagnosis and treatment of diabetes. "I consider diabetes as quite a universal disease. You will encounter it in whatever walks of life you find yourself, whether you are a doctor or not. And it does not make a difference whether a doctor is an eye specialist, a gynaecologist, a dentist or skin specialist, a tuberculosis expert or someone treating a case of gastroenteritis; knowledge of diabetes is relevant in all these medical specialities. I sincerely believe that a doctor, in whatever sphere he might be working, has to know something about diabetes. I therefore feel very strongly that more importance should be accorded to the teaching of diabetes in all the medical schools of this country. At the moment we are studying this disease as it is written up in Western text books, mostly from England or the United States. There, the treatment is based on a type of diet which diabetics can afford to consume in affluent countries; this kind of treatment obviously does not hold true for our country, though other principles of treatment will remain the same. I have compiled a small booklet in collaboration with Dr Subhash Chandra Gupta who is responsible for the diet portion. Called 'Facts for the patients of diabetes', the booklet is slanted to

the needs of the diabetics in India. This publication constitutes a modest beginning in the education of diabetic patients."

Professor Vaishnava, despite his modesty, is not only a national celebrity to whom the Indian Medical Association recently awarded a gold medal for his work on the role of the liver in diabetes but also an internationally recognized authority on diabetes. Professor Vaishnava co-authored a great number of research papers, as for instance on "Hypertension in Indian Diabetics", "Liver Biopsy in Diabetes Mellitus", "A Clinico-Pathological Study of Renal Involvement in Indian Diabetics", "Cause of Death in Diabetes Mellitus", "Ischaemic Heart Disease in Diabetes Mellitus" and many more.

Although the validity of most of the research findings of Professor Vaishnava is quite universal, he never loses sight of the Indian reality. For instance, in a country where most weddings are "arranged" it is important that a physician explain to all parties concerned the precautions to be taken in case of a

diabetic marriage. "But an astrologer will be consulted on such occasions more often than a physician." Professor Vaishnava's wife, whose parents were known diabetics, takes all necessary measures of control, and leads a normal life.

According to Professor Vaishnava, "not more than two per cent of all diabetic cases in India are adequately controlled. The blame must be shared by both the medical profession, which has taken no pains to educate the patients, and the patients, who think that medication is enough and pay little heed to the general instructions of the physicians. I also wish to mention that although an Indian diabetic, observing the treatment schedule, will be fit for work, he will find himself barred from useful employment. The public needs yet to be educated to look upon a diabetic as a person not different from one who has been prescribed to wear eye glasses throughout his life. Through the World Health Organisation I hope to be able to reach many more people than through my individual con-

tacts, and not only the custodians of health but also diabetic patients and others, to make them aware of the problems set to public health by diabetes."

—Courtesy: WHO

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A zinc smelter is to be built at Vishakhapatnam in Andhra Pradesh. The Smelter will have an annual capacity of 30,000 tonnes of zinc metal (Electrolytic grade) and 1,500 tonnes of zinc dust, apart from other major by-products. These include about 45,540 tonnes of sulphuric acid, 96 tonnes of cadmium metal and 2,120 tonnes of pig lead. Though the project was not included in the Fourth Plan, it has since been approved by the Government. It is estimated to cost Rs 21.24 crore including Rs 1.45 crore in foreign exchange. Over 1,000 persons are likely to get employment under this project.

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A WORLD HEALTH DAY FEATURE



The doctor checks the blood pressure since diabetes is often associated with high blood pressure

HOW DR LAWRENCE FOUGHT DIABETES

DONALD GOULD

ROBERT Daniel Lawrence was one of the first to demonstrate that diabetics can live as long, as well and as busily as anybody. Lawrence was a doctor. He died two years ago at the age of 76, which means that he lived some eight years longer than the average British male. He lasted for half a century after his diabetes had been diagnosed, and the discovery of his illness was made a couple of years before Banting and Best discovered insulin.

The discovery and isolation of insulin by Frederick Banting and

Charles Best in Toronto in 1921 came none too soon for young doctor Lawrence, for at that time he had already resigned himself to an early death. But instead, following the great Canadian achievement, he was able to fill a long life with a record of accomplishments most men would envy.

Once he knew that he had diabetes, Lawrence also knew that he must prepare himself for an early death. Some 20 years earlier the Russian, Oscar Minkowski, and the German, Baron Joseph von

Mering, had shown convincingly that the disease was associated with the lack of some substance normally produced by the pancreas. But that knowledge fell short of pointing to a remedy. The Toronto-discovery hadn't yet been made.

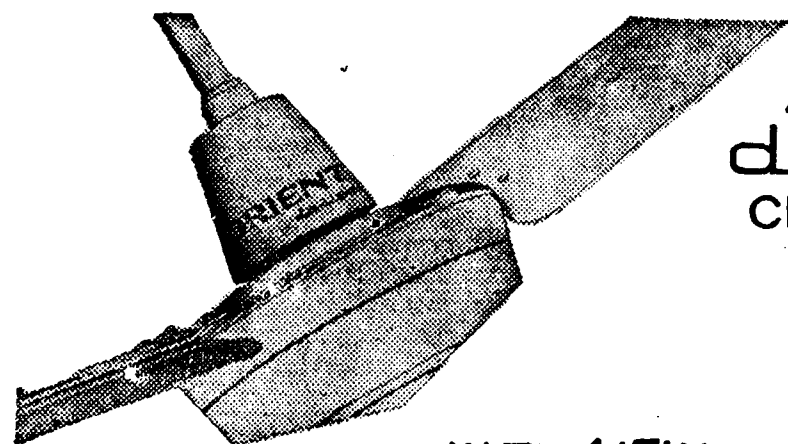
So Dr Lawrence, nearing 30 and with the sight of one eye permanently impaired in an accident dropped his career in surgery and set off for Florence. He had a passion for art, and hoped that the warmth and wonder as well as the fees to be earned by an Englishman in private

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practice would combine to make his last months pleasant. He did splendidly at first, taking care of his own condition. He started dancing and playing tennis again—occupations he had not been able to pursue since the accident in the anatomy room. But then he fell victim to bronchitis.

During this time he had been in contact with Dr Harrison, the biochemist at King's who had originally confirmed the diagnosis. Harrison told Lawrence of the newly discovered insulin, but it seems that the sufferer maintained his proper professional scepticism—even though it was his own life which was at stake—and had refused to become excited at these unlikely tales from across the Atlantic.

But in the Spring of 1923, rather more than a year after the first news of insulin had been broken to the world, Harrison sent a cable to Lawrence in Florence, couched in imperative terms: "I've got some insulin. It works. Come back quick."

Not all of Lawrence's scientific scepticism and reserve could stand up against a summons of that power and promise. He set off for London by motor car with a Florentine friend as a companion and co-driver. They got there, with Lawrence more dead than alive. He was put to bed at once in the casualty ward of his old hospital, and from almost that moment he never looked back.

The Correct Dose

I say "almost that moment", because, of course, his first and immediate visitor was Dr Harrison, and the two men discussed how the new wonder drug, insulin, should be used on the freshly repatriated guinea-pig. How large, for example, should the first dose be? Finally, records Dr Lawrence, they settled on 20 units "as a nice round figure".

In the event, this proved too large a quantity. Because of lack of insulin, a diabetic has too much sugar in his blood. Too much insulin, however, has the opposite effect, and the level of sugar in the fluids bathing the cells of the body fall below the quantity essential for their liveliness. In particular the nerve cells in the brain stop



A young diabetic learns to give himself injections by first practising on an orange.

working briskly. A diabetic who has had an overdose of insulin (or a normal dose of insulin at a time when he is starving, so that his body sugar reserves are low to start with) will suffer faintness, and perhaps unconsciousness, and, if the overdose is extreme, even death.

It was perhaps a mixture of intelligent calculation and sheer good fortune which resulted in Dr Lawrence receiving one of the pioneer insulin injections in a quantity which proved briefly distressing rather than permanently destruc-

tive. He quickly recovered, and he and Dr Harrison soon discovered a dosage routine which kept Lawrence fighting fit.

It isn't difficult to understand why Lawrence, with his able and restless mind, denied the chance of pursuing his first love, surgery, and, made keenly aware of the value of life by a sudden reprieve from an expected death, should have decided there and then to devote the rest of his energies to the care of people threatened by a malady which had shown him its fangs.

He recognised, of course, the life-saving power of the insulin which Banting and Best had identified and isolated from the pancreas gland. But he recognised also (if only from his own experience of the drug) that if diabetics were to take this chance, not only of survival, but of health, energy and happiness, then they would require vastly more than a regular supply of the new potion. They would require, first of all, the most painstaking assessment of their state, so that the right mode of life, and the right pattern of diet and the right dosage of insulin could all be prescribed in terms exactly suited to the very different needs of different patients. Secondly, they would require the continuing care and interest of an expert so that the adequacy of a prescribed regimen could be judged against experience, and so that the upsets caused by changing circumstances (such as pregnancy, or even altered working hours) could be offset by a suitably modified routine. And thirdly, Lawrence recognised that his fellow diabetics would often need, and always welcome, support and encouragement in the task of abiding by the discipline they had to follow in order to stay well.

Research Work

About a year after Lawrence had become one of the first diabetics in England to benefit from regular insulin injections, Dr Harrison, the man who in a very real sense had saved his life, left King's College Hospital to take up a new appointment. Lawrence succeeded him as biochemist to the hospital, and as lecturer in that subject in the medical school. From then on Lawrence put a good deal of effort into research. He experimented on animals, he experimented on patients, and he constantly experimented on himself. He went through all manner of common place manoeuvres to discover what various circumstances might do to the level of sugar in the blood, and what influence various doses of insulin might have under different conditions.

In this first flush of scientific curiosity he was often heard to say that "a day is wasted when I do not do an experiment on myself, or on a patient, or on an animal."

Those who would blame him (and there will be some) for using either conscript animals or innocent patients for the satisfaction of his sharp desire for a deeper understanding of his chosen field, ought to be told that he freely subjected himself to far more discomfort, and even risk than he ever imposed upon either his animal or his human subjects. He would frequently mount a diabolical machine in the laboratory, known as a bicycle ergometer. This is a perfectly innocent-looking standard velocipede, fixed to a frame. But when you mount it and start pedalling, it doesn't move. Instead you find yourself trying to keep the rear wheel revolving against a braking force which is controlled by the experimenter.

Lawrence often worked himself to absolute exhaustion on one of these instruments. He had his blood sampled and analysed before and after this ritual, in order to discover what, if anything, had happened to his chemistry.

In fact, Lawrence's research achieved little of importance. And in that he was only matching the performance of most of his contemporaries in this most difficult field. The chemistry of diabetes is still not properly explained.

His Contribution

Where Lawrence excelled was in his understanding of the problems and anxieties a diabetic has to cope with as a person, on top of the normal load of troubles all of us must hoist and hump from time to time. And he further excelled in the energy and forcefulness with which he was able to demand that the special problems of the diabetic should be recognised—and catered for.

He refused to stay hidden in the comfort of the laboratory, despite his enthusiasm for research. In 1925, a year after his appointment to the post at King's, he published his book on "The Diabetic Life," which has run into something like 20 English editions, and has been reproduced in five other languages. In it he successfully explained, in a manner which any intelligent reader could grasp, the nature of diabetes, and the ideas governing the treatment of the malady. This was a major contribution to his own campaign for boosting the morale and stiffening

the will of the diabetic patient. For clearly a man who understands his problem will deal with it that much more calmly and effectively.

Other popular publications followed, including clear instructions on the planning of a diabetic diet. There were also numerous papers in medical journals in which Lawrence reported on his clinical experience in the handling of diabetic patients and the use of insulin.

Over the years, his influence grew. By 1931 he had left the biochemistry laboratory, to become an assistant physician to King's College Hospital, in charge of a newly created diabetic department. This post established him as an expert in his field, and encouraged an increasing flow of private patients to his Harley Street consulting rooms.

He was rapidly becoming a figure in the medical Establishment. He was given medals and honorary offices in various professional organisations, and an honorary doctorate of the University of Toronto, the birthplace of insulin.

One of his obituarists recalled how, when dining out, Lawrence would scan the menu, not to decide whether any of the fare offered should be declined by a diabetic, but to assess whether he might perhaps, need an extra shot of insulin in order to cope with a meal which he was most certainly determined to absorb. If the menu did look a little high in carbohydrates, then he would roll up a sleeve and give himself a shot there and then, and never mind the lady to the right or to the left.

Another obituarist, writing in *The Times*, said of his late colleague that "In debate he was ruthless in exposing the weakness of an argument, and this made him a stimulating associate and companion."

Diabetic Association

But if Robert Daniel Lawrence, at least in his declining years, took small pains to hide the rudeness of his Aberdonian soul, he did a very great deal for diabetics in Britain. He persuaded a fellow diabetic, H.G. Wells, to write to *The Times* to stimulate (successfully) the birth of a British Diabetic Association, so that some sort of common courage could be shared among those who had to

live with the disease. It was he who had the care to point out to the British Government, during the last great war, that diabetics needed special rations, and could not live on the war diets handed out to still the hunger pangs of the besieged islanders. It was he who pointed out that diabetic children evacuated from the cities to the country during that same war would die unless they were given special and skilled attention, and because of his concern proper units were established for them.

However, it was not by such good works, or even by any inspired clinical skill, that Lawrence best served the cause of diabetics, but by the possibly entirely uncalculated blessing of his own example. Ten years before he died he suffered a severe stroke, and was badly crippled. Six years later, still dependent on a stick and often needing the support of a companion, he went to Toronto to receive his honorary degree.

He had struggled, complete with stick and acolyte, on to the platform. Then his time came to go forward to receive his honour. He pushed aside both his aides—both the stick and the man—and went all alone to the rostrum, and went back all alone to his place.

After Lawrence's death a reader wrote to the British Diabetic Association's magazine recalling the old man's brusqueness. He also recalled how the waiting patients "used to see the great man from time to time going to and from the main consulting room of the clinic, briskly skipping up the three or four steps on the journey back to his own room. His example was a tonic for all of us who encountered him".

That, of course, was the secret of Lawrence's great impact on the diabetic scene. He was not going to allow any sort of illness to get him down. And in shouting out his defiance, and in showing it to be an absolutely real thing, he managed to make some thousands of fellow diabetics feel just as angry and just as well.

Courtesy: WHO

PRESCRIPTION : YOGA

A YOJANA

STAFF REPORT

Patients suffering from glandular and endocrine diseases generally respond to yogic exercises and *kriyas* as these observances do something to the system that keeps it in trim. What exactly they do, or how exactly they act on the body, is still a mystery to medical science. Hence, the various attempts in India from time to time to find out more about the physiological and bio-medical aspects of yoga.

The Yoga Camp for Diabetes being conducted in New Delhi by the Vishwayatan Yogashram is one more such attempt to relate yoga to medical science.

Dr R.N. Sinha, Medical Officer attached to the Camp would describe this attempt this way :

"From the scientific point of view, very little is known about yoga. From personal experience since childhood, I have come to regard yoga not merely as an esoteric subject, but something that requires systematic inquiry. I regard it with respect and scepticism. Also, a lifetime of experience has taught me to respect intuition and faith. The ancient Indian way is the intuitive way. Much of our science is not the science of dissection. Yoga is not only in the realm of science, but of philosophy. What we are trying to do here is to relate that science and that philosophy to the accepted methods of modern medicine."

Dr Sinha, with considerable experience as a medical officer in Bihar and elsewhere, and also as an Assistant Director-General of the Health Services of the Government of India, was attracted to the Camp because it offered him a chance to observe under controlled conditions the effect of yoga on diabetic as well as other patients with chronic diseases.

At present the laboratory attached to the Camp is equipped to conduct only routine medical tests. Though the bio-medical lab is more or less adequately equipped, the X-ray and other plants are still awaiting commissioning. But they are sending periodic reports on whatever advances made to the Council for Research into Indian Medicine and Homoeopathy. Brahmachari Dhirendra, the head of the Vishwayatan Yogashram and the Director of the Camp, is also the member for yoga of the Council.

So far, the Diabetics Camp at Delhi has attracted fifty people in the age group of 33-66, both men and women, belonging to all strata of society. Dr Sinha is able to report a 60 per cent improvement in the condition of many of them.

A patient desiring yogic treatment is admitted to the Camp after strict scrutiny. To begin with, he must not have any other complicating factors or diseases such as tuberculosis or cancer. Secondly, the patient must be able to learn and do the yogic exercises prescribed at the Camp. After screening the personal and family medical history, each patient is subjected to a routine, but thorough, medical test.

Mornings and evenings are taken up with the yogic exercises. The regimen, for forty days, is strict, the hours interlaced with the doctors and lab assistants doing the checks. Liquor, sex and meat are out. Incurable smokers are allowed occasionally to go out and take a pull. Observances also include *kriyas*, stomach washes and suchlike and the usual urine, blood, ECG and other tests. Diet consists of chapatis, vegetables, fruit and 12 ounces of milk both for breakfast and dinner. All drugs, including insulin and others, are discontinued. Calory and weight control are also important measures.

As many of the patients come to the Camp with faith and a good deal of determination, they easily learn to live with diabetes, and to lead a fuller life.

WHAT IS UNEMPLOYMENT?

ERIK THORBECKE

ONE of the more serious problems which the developing countries are likely to face in the next decade is that of unemployment. To quote the Pearson Report: "The failure to create meaningful employment is the most tragic failure of development. All indications are that unemployment and underutilisation of human resources have increased in the 1960s and that the problem will grow even more serious."

In attempting a diagnosis of the unemployment problem a number of questions must be raised. Some are of a conceptual nature—what is meant by unemployment and under-employment? Others, of a quantitative nature—what is the magnitude of un and underemployment? Finally, there are qualitative questions which have to be answered regarding the symptoms of unemployment.

The concepts of unemployment can be looked at in two different ways. To most governments, for census

world is only serious if the very broad definition is used, but rather that there exists a risk of underestimating the problem by using a limited definition such as that of involuntary unemployment.

The growth rate of both population and the labour force increased sharply in the great majority of the developing countries since 1950 in contrast with the developed countries. All developing regions are to a greater or lesser extent affected by this acceleration in the growth in labour force—with Asia and Latin America undergoing the greatest labour force pressures. It is important to realise that this extreme acceleration in the rate of growth of the labour force in the developing world is related very directly to the population explosion.

As for its magnitude, the limited amount of information available suggests that the present level of unemployment is quite high and increasing. Using the narrow definition of unemployment mentioned above, one source

characteristic of most developing countries. As underemployment rises in agriculture, reducing thereby the income opportunities of the farmers, there is a push effect out of traditional agriculture into the urban areas. This push factor is reinforced by the expectation of obtaining a better job and the amenities of city life.

Reflective of this trend is the rate of growth of urban population which in many parts of the developing world is about three times as high as that of the rural population. In some cases the migrants are converted into open unemployed but much more typically end up as part-time, unemployed service workers—shoe-shiners, street vendors, and domestic servants. One could argue that traditional agriculture in the country and the traditional services in the cities are the residual claimants, or rather outlets, for that part of the labour force which cannot be absorbed productively in the other sectors. In other words, the rural-urban migration typically leads to a transfer of unemployment from traditional agriculture to traditional services in the cities.

A final phenomenon, directly affected by the increasing unemployment levels in the developing world is the rising inequality in the distribution of income—the incomes of the traditional farmers and of those employed in traditional services in the urban areas falling in relation to the incomes of the rest of the population. Since the lack of productive employment opportunities means a lower income, the increasing gap between the incomes of the richer and poorer group can be considered to be the mirror-image of the unemployment problem.

The first major cause is the continuing acceleration in the growth rate of population and the labour force which has occurred in the developing world ever since the end of the second world war.

ARTIFICIAL DISTORTIONS

A second factor well known among economists but perhaps not quite as well outside that group consists of the whole set of biases and distortions affecting the prices of labour and capital. A number of policy measures undertaken in developing countries have had the impact of reducing the cost of capital in relation to that of labour. Thus, for example, the maintenance of overvalued exchange rates and of subsidised interest rates encourages the importation of artificially cheap capital goods from abroad. On the other hand, minimum wage legislation, and certain social policies have had the effect of making the price of labour relatively expensive. The natural consequence of these artificial distortions in the pricing of labour and capital was to encourage the adoption by businessmen of techniques of production and, technologies which tended to be relatively capital-intensive using more of the cheap input (capital) and less of the relatively more expensive input (labour). In general, the intended effect of these policies, particularly those relating to labour, appears to have been the achievement of a more equitable distribution of income. In fact, however, it is likely that the progress achieved in terms of higher wages and better social security benefits for the workers was set back by an increase in both absolute and relative un and underemployment.

Another cause of increasing unemployment may be attributed to the tremendous emphasis on industrialisation particularly in the 1950s and early 1960s seen as the unique key to development. The idea behind this strategy was that the industrial sector would pull with it the backward agricultural sector and provide alternative employment opportunities to the rural population. Unfortunately the capacity of the industrial sector to absorb workers productively proved to be extremely limited. At the same time, the discrimination against agriculture prevented agricultural development from taking place. The trouble with this approach, as I have pointed out elsewhere, was that "the backward agricultural goose would be starved before it could lay the golden egg." In other words, the "industrialisation-first" strategy contributed to the increase of unemployment and the stagnation of production in the agricultural sector.

Finally, the inward rather than outward-looking approach to international trade which many of the developing countries have followed until relatively recently has also contributed to unemployment. By concentrating on import substitution as opposed to export promotion, these countries encouraged, by permitting a high degree of protectionism, the creation of a number of extremely inefficient industries. Many of these industries were highly mechanised and did not really provide an outlet for the abundant labour resources available.

There are some indications that a re-evaluation and revision of past policies regarding these two issues—industrial versus agricultural development and import substitution versus export promotion—are now taking place. A more balanced approach is being followed by many governments, influenced by the green revolution as well as the limited scope for further import substitution and its high cost in efficiency terms.

In all fairness to the developing countries, it is important to realise that in many activities the range of available technologies is largely based on and limited by the conditions prevailing in the already developed countries. Much of that technology originated and was designed in the industrialised countries and, therefore, is best suited to the relative abundance of capital and scarcity of labour typical of these countries. It would appear that a major contribution to development and to a reduction of unemployment could be achieved in designing and implementing what has been called intermediate technology. This is the type of technology which would suit the resources and the conditions existing in the developing countries better than present technology. In general, it would have to be somewhat more labour-intensive using relatively more labour and relatively less capital than today. It is high time that the still largely virgin territory of intermediate technology be explored systematically by both engineers and economists.

It is essential in looking at the future to realise that it will take more than a high growth rate of output to resolve the unemployment problem. There are a number of factors, as we have seen, which can reduce

Three is a Double Standard in Measuring it

purposes, unemployment means only that part of the labour force which is involuntarily unemployed. It is not surprising, given the low skill level of a large proportion of the labour force in the developing countries and the relatively high skill requirements to qualify for the available jobs, that this definition yields relatively low unemployment levels.

Another way of looking at unemployment is to compare the available manpower, typically in terms of the total number of man-hours over the course of the year, to the number of man-hours which are actually devoted to work. This alternative measure of unemployment provides a better approximation of the labour resources which are not actually utilised. It includes, in fact, the unutilised resources of those who are only partially (or part-time) employed in addition to the involuntarily unemployed. This last concept is a better measure of both un and under employment and represents the potential but unused labour resources available to the workers of the developing world. In a more meaningful sense the unutilised manpower means a foregone opportunity to earn income and thereby improve the standards of living of millions of individuals who are operating at the subsistence level. Obviously, the definition and the distinction between un and under employment are to a large extent arbitrary. This is not to say that the unemployment problem in the developing

estimated that the level of unemployment in India increased from about 11 to 15 percent between 1951 and 1961. A study of the Organisation of American States (OAS) covering the whole of Latin America estimated that the total number of unemployment rose from 2.9 million in 1950 to 8.8 million in 1965, or from 5.6 percent of the labour force to over 11 percent.

Measuring unemployment by the broader definition shows an even more dramatic underutilisation of labour resources. Thus, for instance, the OAS study estimated that about 25 percent of the labour force in Latin America was unemployed according to this definition, or an equivalent of approximately 18 million workers being completely unemployed in 1960. Similar evidence from various surveys and studies in other parts of the third world are consistent in confirming the scale of the unemployment problem, and its increasing magnitude over time.

Since the great bulk of the labour force is employed in agriculture—ranging between 40 and 80 percent in most of the developing countries—it is to be expected that the greatest underutilisation of labour would occur in that sector.

A phenomenon directly related to the unemployment problem is the increasing rural-urban migration, so

greatly the complementarity between economic growth and employment.

Recognising that a strong complementarity relationship between GNP growth and employment may not necessarily exist and that, in fact, major structural changes may be required to create more meaningful employment opportunities, one can attempt to explore, nevertheless, the future implications on employment of the six percent annual GNP target selected by the Pearson Commission for the decade of the seventies.

A number of projections of the implications of a six percent annual rate of growth of GNP in the developing world on employment have been attempted and they consistently indicate that this growth rate will not be sufficient to absorb the new entrants into the labour force over the next ten years or so. The unemployment pressures would be greatest in West Asia, Middle America, and East Asia but would be serious in the other developing regions.

The main conclusion which can be drawn from these projections is that a target growth rate of GNP of six percent per year would not *per se* ensure the elimination of unemployment in many of the developing regions. Given the extremely low probability of achieving growth rates substantially above it in the developing world in the decade of the 1970s—a substantial jump over the historical growth performance in these countries, amounting to about five percent annual rate in the 1960s—it appears self-evident that major changes in structure and policy will have to be implemented if the unemployment problem is to be resolved or even alleviated.

SOME SUGGESTIONS

Thus, a development strategy consistent with alleviating the unemployment problem would have to concentrate on a number of structural changes and policies, in addition to economic growth as such. Here are some suggestions on the main problem points.

First, many parts of the developing world would have to implement immediately population control policies. The impact of these policies would not have any effect on the size of the labour force over, at least, the next 15 years since those individuals who will be entering the labour force during this period are already born. A reduction in population growth now should, however, reduce the supply of labour 15 to 20 years hence. Given the exponential way in which population has grown in the last two decades, it appears absolutely essential to start reducing the rate of growth of the labour supply immediately.

Second, a major effort should be made by the developing countries to reduce and eliminate as soon as possible the artificial distortions affecting the prices of labour and capital, respectively, and other policies which discriminate against the adoption of labour-intensive techniques.

Third, developing countries should explore the extent to which new and relatively simple techniques requiring more labour in the production process can be applied in agriculture. It is clear that the green revolution (sometimes called the seed-fertiliser revolution) is in progress in some parts of the world. The main advantage of the green revolution is that it may, in a number of instances, reduce the level of underemployment in agriculture and thereby slow down the rural urban migration and the serious urban problems which flow from it. In any case, the effects on labour absorption of techniques based on the high-yielding varieties are much more favourable than when alternative mechanised techniques are used. So far, the geographical and crop coverage of the green revolution has been limited to mainly Asia and cereals (i.e., wheat, rice, and maize) respectively. The scope for the further diffusion of high-yielding varieties to other parts of the developing world and to other crops is great.

CREATE LABOUR-INTENSIVE TECHNOLOGY

It is essential, however, not to view the green revolution as the panacea which is going to solve the unemployment problem on a permanent basis. What it can potentially do over the next few years is to absorb productively some additional labour resources. The limited evidence so far suggests that one of the major effects of the new technology is to increase the labour requirements per unit of land but to reduce them per unit of output as a consequence of the much higher yields on output. Therefore, the very success of the green revolution in terms of a big jump in agricultural output is likely to put a brake on labour absorption beyond a certain point. It is likely to provide a temporary reprieve but certainly not a long-term solution to the unemployment problem.

Another recommendation is that major attempts be made in both the developing and the developed countries to design and apply new and perhaps more labour-intensive technologies in industry. There appears to be a scope for major innovations which would be better suited to the underlying conditions of developing countries. Is it utopian to expect that the technological breakthrough which occurred in agriculture cannot be replicated in other sectors? The recommendations of the Pearson Commission relating to research and technology—notwithstanding their generality—are welcome and worthy of strong public support.

Finally, the developed countries should remove or, at least, reduce discriminatory policies against exports from the developing countries and consider seriously the implications of a generalised preferential scheme on manufactured and semimanufactured imports from the latter. It is conceivable that such a scheme should encourage the adoption of new techniques conforming better to the conditions of these countries.

Courtesy: CERES

PICA

A Pool For Foreign Private Investment

R. SWAMINATHAN

In the Second Development Decade with a prescribed growth rate of 7 per cent, most developing countries, India included, for long uncertain either about the quantum of foreign aid or about its proper role in building their economies, are now facing a situation where the aidflow is falling short of the anticipated rate. The only other alternative is to attract foreign capital investment from private sources. Private Investment Company for Asia (PICA) answers this need.

PICA is short for the Private Investment Company for Asia, an international financial institution set up in 1969 to promote private investment in the developing countries of Asia. It has its head office in Panama, but its operational headquarters is in Tokyo, Japan.

PICA is a multinational corporation consisting of shareholders representing leading private companies and financial institutions from three groups of countries, namely Europe-Canada-Australia, Japan and the USA. Out of 112 shareholding companies, there are 56 from Japan, 26 from the US, 17 Europe, 6 from Canada and 5 from Australia.

The Board of Directors, drawn from the shareholding companies of the three groups, consists of a President and 21 Directors. The Executive Committee consists of 10 Directors composed of the President, the Chairman, the Vice-Chairman and 6 members of the Board and a Chairman to be designated by the Board. The Executive Committee is responsible for the investment operations of the company. The President is the Chief Executive of the company and is assisted by professional staff.

The authorised capital of PICA is US dollar 400 million, of which 168 million have been paid up. The authorised capital is divided equally among the three groups of shareholding countries. The company can borrow funds to increase its capital and can also augment it by participation of local and international investors and private and public financial institutions.

The primary objective of PICA is to promote private business investments in the developing countries of

Asia, excluding Japan, Australia, New Zealand and Hong Kong. The company would participate in investments both by loans and equity. In addition to providing loan and equity capital for new and existing enterprises, PICA also renders technical and professional advice, underwrites and manages the sale of securities, arranges financial facilities with other investors in developed countries, obtains investment partners for enterprises approved by it and consults with potential private investors in Asia regarding existing investment conditions. Besides, it also conducts surveys and feasibility studies to identify sound business profits which would promote economic development. The professional staff of PICA would be able to give technical and managerial assistance to the enterprises in which the company invests.

Profitability Criterion

In considering projects for investment, PICA will be guided by their profitability as also their beneficial effects on the economic structure of the country or region. After identifying investment opportunities, PICA will prepare sound financial plans for the projects and approach potential investors in the host countries and abroad to finance the enterprises. Equity capital and medium and long-term loans will be provided both for establishing new enterprises and for expanding and diversifying existing companies. It will also have the option to convert its debts into equities of the operating companies.

Emphasis will be placed on investments in medium and small size private enterprises in manufacturing, distribution, services, transport and

processing of agricultural products. Investments and processing of agricultural products will be guided into developing countries having suitable climate for private investment, particularly those having a reasonable political, economic and monetary stability and freedom for private business activities. In its operations PICA will diversify both in terms of countries and projects. Encouragement will be given to local controlling management and PICA itself will accept minority participation. Joint ventures with domestic investors, entrepreneurs, manufacturers and financial organisations and also with foreign investors and other international industrial and financial organisations will be encouraged.

In lending support to any project, PICA after reviewing the economic and investment climate of the country will examine its technical and financial aspects. In evaluating the soundness of the project it will take into account the competence and the reputation of the management group that will operate the enterprises, reputation and experience of the sponsors or the investors in the project, its profitability, growth prospects, marketing prospects, technical soundness, capital structure etc. Investors who have sound projects have to furnish PICA with detailed information which would enable the company to subject the proposals to careful scrutiny before committing its funds to the projects.

In the first year of its operation PICA has done a good deal of ground work to publicise its objectives and has created a good deal of interest in its activities. During 1969, 177 proposals were submitted to PICA covering primary, manufacturing and services industries. Of these, 32 proposals were

New Kidneys For Old

S. V. RAGHAVAN

Our Madras Correspondent

THE Christian Medical College Hospital at Vellore, about 150 kms from Madras, made medical history when two successful kidney transplants were achieved there in the months of February and March this year.

The first kidney transplant operation was performed on February 2, on Shri Shanmugham, a businessman of Coimbatore in his early thirties. The second patient is a 29-year engineer from New Delhi, who was operated on March 2. Both the patients have taken up residence temporarily in the quiet extension area of Vellore for the post-operation check-up, spread over three months. They are neighbours living opposite each other and Shri Shanmugham, who drives his own car, gives the young engineer a lift every time he goes to the hospital.

The two graft kidneys were taken from living persons. Shri Shanmugham got his kidney from one of his relations and the engineer had his own father's kidney grafted. The two donors are hale and hearty. The 55-year old father-donor is all smiles and feels as fit as he was when he parted with one of his kidneys for his son. Doctors say one quarter of one kidney is enough to keep a person going.

Both the patients are on the road to rapid recovery and look forward to resuming their duties as early as they can. Only, both of them will have to remain at Vellore for the next two to three months, and come again for checks once in three or six months for some more time.

The transplant operation took nearly four hours in each case; the kidney removal from the donor took about two and a half hours and the post-removal convalescence took about five days.

The doctor who handled the cases (and who wishes to remain anonymous), completed his first spell of

studies in the Christian Medical College, and, after post-graduate study, was in Australia for three years for specialisation in kidney transplants. He returned to Vellore in November 1970. Asked to describe this most delicate of surgical operations, the doctor said that the entire operation consisted of two phases—one of removal of a live kidney and the other the graft. We have to prepare simultaneously two theatres, two surgical teams, two anaesthetist teams and two nursing teams. "We get the donor first and take his kidney and then get the patient".

"The kidney is not put in the back where it ought to be, but in the front above the navel just beneath the skin, and joined to the blood vessels. The ureter which drains the urine is put into the bladder. We also wash off the blood in the kidney before the transplant."

"A kidney removed from a living person or from a cadaver within half an hour of death can be preserved in an ice box for about eight hours by which time the transplant should be completed."

"The patients when they come are in a state where they are fluid-overloaded, completely oedematous. In that state they are unfit for any kind of surgery. So we put them on an artificial kidney. This involves connecting silastic (a kind of plastic) tubes to the artery which will get the arterial blood out and another tube into the vein which will take the blood back to the system. The two tubes are joined up. When the patient is not on the machine the silastic tube is joined to the blood vessels. The alternative is to join the blood vessels under the skin, a minute operation. It needs care."

"In India, we are using the silastic tubes, called the A.V. Shunt (arterio-venous shunt). Twice a week the patient comes to the machine. The blood goes into the machine. It filters off all the impurities and

returns the purified blood to the system. This has to be performed for a period of 12 hours continuously. During this period the patient may read or eat, only he remains tied to his bed. He is allowed 1,000 cc of fluids and 30 grams of proteins a day."

"At the end of 12 hours he is disengaged from the machine, the shunt re-established. He can go home if he can do it at home or train his wife to do a technician's job. This is what is called home dialysis. The whole process is called Immo dialysis or artificial kidney. One can go on like this indefinitely, without an operation, but at best it can only be a temporary measure."

"The first patient was on Immo-dialysis for 15 months before surgery and the second since August last till March this year."

"What is the nature of the post-operative check, and for how long?"

"The normal reaction is for the body to reject the foreign kidney. This is a process that starts right from the time circulation is re-established. The rejection has to be controlled and we use two drugs, Prednisolone and Imuran, administered in careful doses, and progressively reduced, till the rejection is completely controlled."

"A further serious hazard is infection, the commonest cause of death. We have to prevent it in the early stages by administering a high coverage of drugs."

"We also put them in special rooms. The doctors and nurses take particular care not to carry any infection. They are set apart for the work and approach the patient in high clinical cleanliness. It is costly but we do not take any chances."

"The patients remain under close watch for about two weeks after which the drugs will be cut down. After three weeks they can go home in a reasonably healthy condition. However, we caution them against infection by frequenting crowded cinemas, etc."

"The programme does not permit any trial or error. We do not experiment with anything. We made sure we had all the drugs; all the facilities and equipment."

seriously considered and are likely to materialise in due course. Two agreements were signed during the year, one for a project in Malaysia involving \$ 6 million for an integrated textile mill by Malaysia and India and the other, a \$ 4.1 million project in Philippines, for the expansion of a ceramics tile plant. The largest number of enquiries was received from Korea (46 proposals) followed by Indonesia (29), Taiwan (20), Philippines (18), Thailand (15) and India (13). This is enough indication of what PICA can do to stimulate and promote economic development in vital areas through private sector investment.

Attracting Foreign Capital

PICA's main aim is to encourage both the growth of the local private sector and the inflow of the foreign private capital. It has recognised that official aid received from one Government to another is no doubt important from the point of view of both its size and terms. At the same time, PICA realises that official aid supplemented by private capital from foreign countries will help accelerated economic development of Asian countries. The mix of private and Government

assistance would ease the problem of capital shortage of the developing countries of Asia. PICA seeks to identify, develop and implement investment opportunities in these countries which will require considerable expertise. Developing countries need beyond capital, both monetary help and assistance in technical, market and financial planning. These services also will be made available to the developing countries of Asia by PICA gradually.

One of the deficiencies of the developing countries is the lack of well-developed capital markets, without which industrial development will be considerably handicapped. PICA also seeks to promote the development of capital to be diverted into high priority sectors of the countries.

Despite the fact that PICA is just one year old, it must be conceded that it has made a good start. There is no doubt that the overall investment climate in Asia in general is receptive to private enterprises. It has also recognised that foreign private investment has to play a supplementary role to local capital. That is why it has emphasised strengthening the joint venture approach.

Over 1,000 Villages To Be Electrified In West Bengal

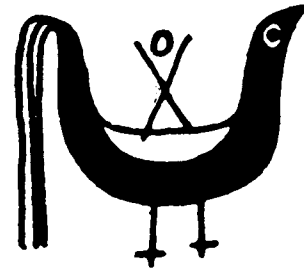
THE West Bengal State Electricity Board is to launch a large-scale programme of rural electrification. Under the programme, 1,172 villages, 5,109 irrigation pumpsets and 11,443 rural industrial units in five districts will be given power connections. In addition, domestic and commercial connections will also be provided. The schemes, to be implemented in selected areas in 24 Parganas, Hooghly, Midnapore, Birbhum and Bankura districts, will cost Rs 313.90 lakh and will be met by Rural Electrification Corporation.

Some more schemes of rural electrification covering certain areas in the districts of Burdwan, Murshidabad, 24-Parganas, West Dinajpur, Purulia and Nadia, sponsored by the West Bengal Electricity Board for loan assistance are now engaging the attention of the Corporation.

Apart from providing electrical

power for operating agricultural pumpsets installed in shallow tubewells, these schemes will provide electric power for small industries and agricultural processing industries, such as rice hullers, rice mills, *atta chakkis*, saw mills and cold-storage plants. At present, many of these industrial units are operating on the more expensive diesel power.

The Rural Electrification Corporation, set up in July, 1969, with an authorised capital of Rs 10 crore, is wholly owned by the Central Government. The Corporation has so far sanctioned 93 rural electrification schemes all over the country, including 5 Rural Cooperatives for a loan assistance of Rs 6,065.147 lakh. These schemes on completion will enable the electrification of 8,261 villages and energisation of 1,59,352 pumpsets. During the first year of its working the Corporation has made a profit of Rs 4.47 lakh.



QUOTATION BOX

If dust is all the people know, they find it hard to create much more than dust.

—V. S. Naipaul quoted in "The Statesman"

The principal difference between a playful little rascal and juvenile delinquent is whether he is your kid or somebody else's.

—from a New York Newspaper

As for the film's entertainment value, it is worth its length in multiple yawns.

—from a film review in "Blitz" Weekly

The people who drink and dope and sit around with nothing on, being photographed—even if you spend \$5 million on psychiatrists for them—they are just pigs.

—Katharine Hepburn

Hearing the 'anti-man' ads, one cannot help the conclusion that these are mostly written by either married women with a persecution mania or spinsters with an incurable hatred for men. If American wives were ever to get hold of translated versions of the ads, you can count on a mass invasion by women's lib volunteers in chartered jumbos.

—from a 'middle' in "The Times of India"

These days, a child who knows the value of a dollar must be mighty discouraged.

—from an American contemporary

When John Gunther visited Japan thirty years ago he asked a Japanese friend: "If the Emperor is a god, to whom, does he pray?" The answer was: "To his ancestors".

—Ariel in "The Sunday Standard"

Any one, who looks like a hippy, has to satisfy the immigration officers that he is not, before being allowed into Singapore.

—A news item in "The Statesman"

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WATER MANAGEMENT

Need For Scientific Approach

K. CHELLAPPAN

AGRICULTURAL growth is at the base of our development strategy. Within the overall strategy of growth, irrigation has been accepted as a major programme for modernising Indian agriculture.

The importance of irrigation in Indian context may be appreciated in terms of certain specific roles which can be attributed to it. First, in the broad framework of soil climate complex, irrigation has a protective role against the vagaries of monsoon. Secondly, even with the given technology, mere provision of assured water supply can boost the productivity of existing inputs. And thirdly, for the introduction of a new technology, irrigation acts as a catalytic agent and has one of the crucial factors in the package of improved inputs and new technology.

The problem of floods and droughts is the problem of challenges and opportunities. If the waters which run waste to the sea, causing untold damage and destruction on the way, can be harnessed through conservation measures and released in regulated supplies during the periods of short supply, the challenges of both floods and droughts can be transformed into opportunities for providing more and assured irrigation water to the thirsty land. It would also mean more water for the generation of hydro as well as thermal power, more water for hundreds of industries and more water for domestic use.

With the initiation of the First Plan, greater emphasis was laid on minor irrigation works and finances were allotted for extending them. The importance of minor irrigation programme like wells and tubewells, became more pronounced in view of the sad experience faced in the two successive years of drought, in 1965-66 and 1966-67. The launching of the High-Yielding Varieties Programme

from *kharif* 1966 has brought out the imperative necessity of assured water supply and has led to sharp increase in demand for works like wells and tubewells.

The Planning Commission estimates productivity of irrigated land to increase almost by double (i.e. 93 per cent more) as compared to the unirrigated land. The areas irrigated were about 56 million acres* in 1951 and 88 million acres after the completion of the three Plans with food production of 50 and 80 million tonnes respectively. The forecast for the current crop year is estimated to be 100 million tonnes of production.

The Fourth Plan envisages an annual growth rate of 5 to 6 percent in agriculture and visualises an increase in irrigation potential (in terms of gross area irrigated) as under:—

Gross irrigated area (irrigated harvested areas)			
(million hectares)			
At the end of the year	Surface water sources	Ground water sources	Total
1968-69	25.0	10.9	35.9
1973-74	29.8	13.2	43.0

A more dynamic role has to be given to irrigation in the context of technological revolution taking place in Indian agriculture. Rain-fed agriculture has only limited potentialities for absorbing modern inputs. In a very real sense, the success of the new strategy enunciated in the Fourth Plan, based on the extensive use of HYV of seeds to heavy doses of fertilisers and package of impro-

*Source: A note on the rate of growth during Fourth Plan. Planning Commission, April 1967.

ved practices, is dependent on the availability of irrigation facilities.

The public expenditure for creating the irrigation potential of 18 million acres by minor irrigation works is estimated at nearly Rs 540 crore over the period of the three Plans.

Rainfall in India is erratic with considerable variations with regard to quantity, incidence and duration. Because of its tropical and sub-tropical climate, India has potentialities to grow crops on a year round basis. However, this potential remains unexplored largely because in a greater part of the country, 80 per cent of the annual rainfall is received in less than four months during the monsoon season. Thus even where rainfall is high it is not adequate to support multiple cropping. The vulnerability of Indian agriculture to fickleness of the monsoon is well known and it is still largely a gamble.

The Indian Irrigation Commission (1901-03) classified the sources of irrigation into canals, tanks, wells and other sources which included, mainly, bunds for storage of rainfall, lift irrigation from rivers, etc. Tubewells are of recent origin. Canals, dams and reservoirs constitute major irrigation works and minor irrigation includes all works which are completed within a short period and do not require large financial outlay. The crucial role of minor irrigation in augmenting food production within a short time was given due importance during the Grow More Food Campaign. The G.M.F. Enquiry Committee highlighted the role of minor irrigation. Major or medium irrigation schemes are generally more capable of withstanding the severity of droughts. Nonetheless, to make fuller utilisation of the irrigation potential, minor schemes are also of paramount importance. It is rightly said that the irrigation system can convert a desert into a granary (e.g. the Ganga Canal which changed the face of northern desert of Rajasthan in Shriganganagar district).

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FCI DRAWS UP SPECIFIC TARGETS FOR CURRENT YEAR

The Food Corporation of India has drawn up specific targets for fulfilment during the current financial year. The target for wheat procurement during the current *Rabi* is four million tonnes. Given a normal *Kharif* season, the target for rice procurement will also be of the same magnitude. The Corporation will aim at raising the ratio of procurement direct from the farmer or through the cooperatives to 50 per cent of the total for price support operations and to 75 per cent of the total for commercial purchases. It is also concentrating on developing a system of operations to cut down costs and reduce the incidentals still further.

During 1971-72 the Corporation expects to build up additional storage capacity of about 13 lakh tonnes. It is expected that the buffer and operational stocks of foodgrains

will rise to about six to seven million tonnes during the years.

There are several engineering and construction projects the completion of which is envisaged within the financial year. The maize milling plant at Faridabad will be commissioned by October. The rice bran solvent extraction plant at Ujjain will be commercially operated from November. All the 24 modern rice mills will be fully commissioned and operated by the beginning of December. The silo at Faridabad will be completed by April 1972 and work on the proposed silo at Naraina will commence in October this year so that it will be available for the *Rabi* season 1973. Preliminaries for at least three more silos of 20,000 tonnes capacity each at Moga, Bhatinda and Ghaziabad or Khurja will be completed by the third quarter of 1971.

INDIAN FIRM GETS ORDER FOR INCUBATOR SUPPLY

Under a contract signed recently for the establishment of five new chicken hatcheries in India, FAO's Freedom From Hunger Campaign in Rome has placed an order for 20 big incubators with an Indian firm. The order is worth about 60,000 dollars and the firm's tender succeeded against strong international competition. FFHC's choice is based on the price quoted by the manufacturer, the high quality of his products and the local service facilities he offers.

The incubator models have been developed over several years by an Australian FAO Poultry expert in India in collaboration with the Indian manufacturer. The 20 machines, each having a capacity of 13,500 eggs, are completely automated. The manufacturer had earlier won several export orders to Burma and Indonesia for smaller types of similar incubators and of feed mills.

The new FFHC order follows purchases made in India, over the

years 1964-1970, of over one million eggs capacity in smaller incubators (2,500 eggs each) and of over 40 feed mills by UNICEF. In each case, lower prices, high quality and more suitable designs for local use were the reasons for placing the orders in India.

ASSAM'S ECONOMY

Our Shillong Correspondent

Though Assam has three-fourths of its population depending on agriculture, over the years there has been a steady transformation of the State's economy from agricultural to a more diversified one.

In 1950-51, agriculture and allied pursuits accounted for more than 65 per cent of the State's total income. This figure went down to 47 per cent in 1968-69.

The estimates of the State's income at current prices, have been placed at Rs 790.6 crore in 1967-68; Rs 810.4 crore in 1968-69; and Rs 816.6 crore in 1969-70. Assam's per capita income during these years stood at Rs 557.7; Rs 556.1; and Rs 545.1 respectively.

MORE AREA UNDER ARHAR DURING 1970-71

According to first estimates, Arhar cultivation during the current year increased by 2 per cent in area from 2,200,900 hectares in 1969-70 to 2,244,000 hectares. The present estimate, however, does not cover the entire area under arhar.

HEALTH AND MUNICIPAL SERVICES IN WEST BENGAL

Work is in progress for creating 900 additional hospital beds in West Bengal by 1972-73. This is being done by constructing two new hospitals and 100 new dispensaries spread over the State. Facilities at a number of existing hospitals are also being expanded as a part of the programme for the development of the Calcutta Metropolitan area.

Since some of the construction work for this purpose could not be undertaken by the Public Works Department of the State, the State Health Department has decided to have the work executed expeditiously through its Public Health Engineering Directorate.

The Government of India also intends to provide the necessary foreign exchange for procurement of grooved tramways rails (curved tram tracks) for remodelling the Howrah Station areas, acquiring equipments for mechanical sewerage, cleansing and garbage removals and for import of special quality of steel plates for Talla-Palta water mains.

SILK PRODUCTION CLOSE TO 4th PLAN TARGET

The total production of mulberry silk in India during 1970 was 22.56 lakh kg. as against 17.58 lakh kg. in the previous year. The growth rate works out to 28 per cent. Disclosing these figures, the Central Silk Board says the achievement is significant in the context of the Fourth Plan target of 23 lakh kg for mulberry silk.

Mysore State accounts for more than 70 per cent of the total output of mulberry silk in the country. Its output in 1970 was 18.77 lakh kg.

CROPPING PATTERN IN MADHYA PRADESH

D. C. AGARWAL

MADHYA Pradesh with an area of 4,43,459 sq. kms. is known to be surplus in food grains. Nearly 86 per cent of the people live in rural areas and their mainstay is agriculture. But still, India's largest State is far behind many others of comparatively smaller dimensions in production and technological development of agriculture. Located centrally, the crop pattern in this State is a combination of those found in various other States on its periphery with modifications necessitated by local conditions. Almost all the principal food crops are grown here. The Table on the next page shows the overall cropping pattern and the variations thereof. The cropping patterns have been compared at four points on the basis of averages of the area under crops. The first three cover the average of the first three Plans while the last one covers the average of three years only.

Cereals and Pulses

On the whole, the land utilisation trend under different cereals indicates that rice, wheat and jowar are the three most important crops, which covered among themselves nearly 48 to 50 per cent of the gross cropped area. Of the total area under cereals about 70 per cent was under Kharif cereals and about 30 per cent under Rabi cereals.

It will be seen that whereas rice, covering the highest average area of cropped area, registered an increase of 5.6, 4.7 and 0.8 per cent successively in the Second Plan, the Third Plan and 1967-69, there was spurt in a real big way in area under wheat. Wheat registered a rapid increase of 32.3 per cent during the Second Plan over the First Plan but subsequently registered a minor increase of 1.9 per cent in the Third Plan over the Second Plan and then recorded a setback sharply by 14.08

per cent during 1967-69 over the Third Plan on account of severe drought in this period.

During the period under review the proportions of Jowar, bajra and maize remained almost the same, but they continued to occupy a significant position. If these crops have sustained their magnitude in the cropping pattern of Madhya Pradesh and the area under these has expanded to a great extent, particularly during 1967-69 over the Third Plan, it is because these crops provide insurance to the cultivators against the risk of low rainfall and seasonal fluctuations. Moreover, high yielding varieties have also encouraged their expansion during this period.

The proportion of pulses like gram, tur, moong and urad also have remained almost static.

The area under cotton, however, showed an erratic trend. It first declined sharply then increased moderately and again started dwindling rapidly. On the other hand, sugarcane showed mounting increase in area during the period touching an all-time high of 62,000 hectares in the Third Plan after which it suffered substantial setback during 1967-69. A similar trend was noticed in oilseeds which had registered a steady increase during the period of three Five Year Plans, but declined by 5.7 per cent during 1967-69 over the Third Plan. Among oilseeds, groundnut, sesamum, linseed and rape and mustard are the most important commodities both in area and production.

These facts prove that high-value crops are being preferred to low-value crops. The overall picture spotlights that it is only the area under rice, pulses and maize which registered steady increase during the period of eighteen years from 1951-52 to 1968-69. Although the area under wheat, sugarcane and

oilseeds also recorded substantial increase during the period of three Five Year Plans, it dwindled during 1967-69. This is on account of the fact that after a good harvest in 1964-65, the State had to face consecutive years of drought as a result of which the economy went out of gear.

Food and Non-Food Crops

About the average area and the percentages of gross cropped area constituted by food crops and non-food crops, it is estimated that over 83 per cent of the gross cropped area was devoted to food crops and only about 17 per cent to non-food crops, and that during the Plan period these proportions remained more or less stationary with a nominal decline to 82 per cent in 1967-69.

On the other hand, the percentage variation in average area under food crops expanded positively and that of non-food crops after an initial setback during Second Plan increased appreciably by 8.3 per cent in the Third Plan over the Second Plan and by 22.2 per cent in 1967-69 over the Third Plan.

Double Cropping

An appreciable part of Madhya Pradesh is under only the single crop system, the average area under double cropping being negligible. In 1967-69 the average double-cropped area amounted to 14.93 lakh hectares as against 16.98, 19.50 and 19.83 lakh hectares in the First, Second and Third Five Year Plans respectively. This decline corroborates the fact that double cropping has reached a saturation point in terms of the existing irrigation facilities. Further, the double cropped area formed 8.33 per cent of the gross cropped area and 9.07 per cent of the net cropped area in 1967-69 which was below the previous levels showing stationary trends during the Plan periods.

The cropping pattern of Madhya Pradesh still shows a high degree of diversification in the use of cultivated land. The farmers grow many crops which are not very suitable or appropriate from the point of view of yields and consequently of farm incomes. The diversity is an outcome of subsistence type of

CROPPING PATTERN : AVERAGE AREA UNDER CROPS AND VARIATIONS THEREOF

Crops	Area in '000 hectares				Percentage of variation		
	I Plan average	II Plan average	III Plan average	Average 1966-67 to 68-69	I to II Plan	II to III Plan	III to 1967-69
Rice	3,785 (22.66)	3,998 (22.64)	4,186 (22.87)	4,219 (21.86)	+5.6	+4.7	+0.8
Jowar	2,033 (12.16)	1,900 (10.75)	2,013 (11.00)	2,386 (12.36)	-6.5	+5.9	+18.5
Bajra	196 (1.17)	173 (0.98)	186 (1.01)	258 (1.34)	-11.76	+7.5	+38.7
Maize	406 (2.43)	452 (2.56)	487 (2.66)	577 (3.00)	+11.4	+7.7	+18.5
Wheat	2,243 (13.42)	2,968 (16.84)	3,025 (16.52)	2,599 (13.47)	+32.3	+1.9	-14.08
Pulses	3,468 (20.75)	3,658 (20.71)	3,762 (20.55)	3,830 (19.85)	+5.4	+2.8	+1.8
Sugarcane	34 (0.20)	45 (0.25)	62 (0.34)	46 (0.23)	+32.3	+37.8	-25.8
Oil-seeds	1,530 (9.16)	1,726 (9.77)	1,907 (10.42)	1,799 (9.32)	+12.8	+10.5	-5.7
Cotton	871 (5.21)	781 (4.40)	815 (4.45)	761 (3.95)	-10.3	+4.3	-6.6
Others	2,148 (12.84)	1,963 (11.10)	1,865 (10.18)	2,823 (14.62)	-8.6	-5.0	+51.4
All Crops	16,714 (100.00)	17,664 (100.00)	18,308 (100.00)	19,300 (100.00)	+5.7	+3.6	+5.4

Note : Figures in brackets show percentage of gross cropped area.

farming combined with hazardous agriculture.

Of the total cropped area, more than 82 per cent is devoted to food crops only. This makes the character of agriculture in the State essentially of a subsistence type.

Cereal Production

Farm production in Madhya Pradesh is essentially cereal cultivation, since 66 per cent of the gross cropped area and about 75 per cent of the total area under food grains is devoted to growing cereals of which rice is the most predominant. The predominance of cereals cultivation, which is because of the heavy pressure of population on land, increasingly makes the State dependent on monsoon. The influence of the monsoon on the cropping pattern is, therefore, very

dominant. Of the total cropped area in the State about 60 per cent is under Kharif and only 40 per cent grows Rabi crops, from which it can easily be concluded that irrigation here holds the key to the changing cropping pattern.

Although Madhya Pradesh is known to be surplus in food grains, it is far behind other States like Punjab, Haryana, Uttar Pradesh, Tamil Nadu, Maharashtra and Gujarat in the technological development of agriculture. The study of cropping pattern corroborates the fact that warrantable diversion from traditional agriculture is not visible. The prime obstruction is a hiatus in irrigation. On the other hand, in view of the region's present performance in agriculture it also seems plausible that once breakthrough in its traditional cropping

pattern takes place it may push the State to an era of agricultural surpluses, in tune with its physical expanse.

New Life Insurance Policy for Farmers

From April this year, the LIC is introducing a new policy called "Centenary Policy". Under this, agriculturists will have the benefit of a new type of life insurance. Since their income is subject to the vagaries of nature, their policies will be kept in force even if there is a default in the payment of premium up to two years. This default can be condoned if it is due to drought, flood or crop failure, affecting the policy-holder's income.

AGRO-BASED INDUSTRIES FOR RURAL AREAS

Y. W. BLESSED SINGH

THE poverty of our rural masses is appalling. It is certain that a reasonable farm income will be enough attraction for many a farmer to stay on land. However, Indian agriculture with its built-in depressers, such as fragmentation of land, unscientific operational methods, rural debt, disguised unemployment etc., is not providing a reasonable income for most farmers. Disguised unemployment or underemployment needs special attention. The crux of the problem is to find ways and means to employ the farmer all the 365 days of the year.

The ideal means to achieve this will be to make agriculture itself as a whole year occupation of the farmers. All efforts should, therefore, be concentrated on providing perennial irrigation, chemical manure, technical knowledge etc., to pull agriculture from the present precarious level to a prosperous one. With the growth of modern farming, auxiliary industries in the villages will spring up automatically creating employment opportunities.

Dairy farming, poultry farming and vegetable gardening are ideal cottage industries which will not only provide subsidiary employment to our farmers, but also additional income. In fact, these occupations are not to be considered as industries, they are part of agriculture itself. They are also important because their products are included among the essential commodities of human consumption. A small farmer with a cow or a she-buffalow will not only meet the manure requirements of his farm, but also get sufficient milk to augment his income for a greater part of the year.

The Panchayat Unions can help the farmers in the distribution of milk and milk products. After a careful survey of the needs of the rural and

the nearby urban population, dairy products like milk, cheese, butter and ghee can be marketed through either cooperative societies organised by the Panchayat Union or through the nearby municipalities. It is encouraging to know that some municipalities have taken up the distribution of milk not only to the resident city population but also to hospitals, maternity centres, factory-creches, hotels, restaurants, nurseries, primary schools, public offices, firms and factories.

As regards poultry farming, native birds are not of a good quality and native labour is as yet ignorant of the way in which fowls can be reared for eggs. Poultry of a very good variety like the Leghorn and Rhode Island can be introduced to our farmers by the Panchayat Unions and marketing of eggs undertaken by them. A farm product depot maintained by the Panchayat Union at the nearby town where eggs and poultry, milk and milk products, vegetables, cereals and pulses will be available for sale is sure to be a profitable business.

Other Industries

While on the subject of village industries other than those allied to agriculture, we should not forget that the farmer is not an artisan and only agro-based cottage industries, not requiring elaborate special training, should be provided for the farmer. It is also essential that it should be a seasonal occupation; otherwise productivity is likely to suffer in agriculture as well as in the cottage industry the farmer has taken to. Moreover, the waste of land in agriculture and of capital equipment in the cottage industry in their off-season will continue. Therefore, indiscriminate advocacy of cottage industries of all varieties is not the solution.

However, a variety of cottage Industries have been established in our villages with Government assistance provided through the community development project, Khadi and Village Industries Commission, Industries Department and the Harijan Welfare Department. In the Panchayat Unions, great emphasis is placed on village industries such as bee-keeping, palm-gur, palm leaf products, hand pounded rice, oil, pottery, tanning, brick-making etc., to name a few. Since Independence the Government's policy towards village industries has undergone a change and over Rs 588 crore have been spent on fostering village and small scale industries during the three Plan period. The Karve Committee was set up in 1955 to recommend positive steps in this direction and its recommendations in respect of organisational set-up, technical knowledge, marketing and sales, raw materials and power have been implemented. The suggestions of the International Planning Team sponsored by the Ford Foundation in 1954 were also considered and implemented in part.

Supply of tools at low cost or free of cost, provision of tanning pits, improved kilns, worksheds, palm-gur pans etc., and training of artisans at town centres are some of the ways in which the Panchayat Unions are assisting the Village industries. The question of marketing their products, still remains unanswered. While jaggery, fibre products, eggs, vegetables and honey have a fairly steady market, soaps, hand-made paper, wooden toys, earthen pots, tanned leather and leather products do not find a market because their quality is very poor. Even Government department do not patronise the products of village industries. It should not be forgotten that an assured market is the primary factor in the developments of village industries. To achieve this, cottage industries should be related to agriculture and government should patronise the products of these industries.

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UDAIPUR FARMERS TAKE TO POULTRY KEEPING

TILL recently no farmer in Udaipur district of Rajasthan took poultry farming seriously. Now a cursory glance around Udaipur will convince anybody that poultry keeping is gathering momentum. There is a reason behind this change. Due to failure of rains for two consecutive seasons, the farmers were on the look-out for some other means of livelihood. It was then that the Extension workers of the Directorate of Extension, University of Udaipur, came to their help. They trained some farmers in poultry keeping with the result that one finds poultry houses littered in villages like Khempur Madari, Kotharia, etc. of Mewar area.

Varda Gameti is one of the 30 trained farmers of Khempur Madari, a village near Udaipur. Having lost a leg in an accident, Varda is

incapable of doing any field work but he had to feed four children besides his wife. He started a poultry farm with one-day-old White Leghorn chicks. He added 200 more birds to the farm after three months. He found the deep litter system very convenient to the birds and profitable too. On an average, he is getting a net income of Rs 300 per month from his 500-bird poultry farm. He is planning to increase the number of birds as his eldest son has also learnt the art and is now helping him.

In Kotharia, another village 50 kilometres away from Udaipur, two brothers, Shiv Dayal Singh and Shivdan Singh, and their younger sister Kumari Pratibha Singh have given a lead in this direction. During the famine period, when many farmers were preparing to quit the

village, the two brothers encouraged them to take up some alternative vocations like poultry keeping. They set an example to others by starting a poultry farm with 100 one-day-old chicks. Now they are busy with the farm operations and find little time for poultry. So, they left this job to their sister, Pratibha. Like Pratibha, many farm women in the villages around Udaipur have turned out to be good poultry keepers.

Photos above show:

(i) A physically handicapped farmer Varda Gameti, supporting himself on crutches is taking advice on poultry keeping from the Youth Organiser.

(ii) Mohini Bai and (iii) Shivdan Singh are busy arranging food for their birds.

TRIBAL WELFARE THROUGH FOREST LABOUR COOPERATIVES

R. DASS

SINCE Independence, measures have been taken up for checking the exploitation of the tribal people by money-lenders, forest contractors, landlords and other intermediaries. One of such measures is the organisation of Forest Labour Cooperative Societies in the tribal areas of various States the main objective being the replacement of contractors and giving a decent living wage to the tribals.

The forest labourers' cooperative societies movement was first initiated in the late forties in the State of Bombay. The object underlying the movement, that has since gained momentum and is fast developing, was not only to give the tribals full wages along with a share of profits, but also to train them gradually to take up the responsibility of conducting the societies themselves. This experiment of the Bombay Government also attracted attention of the Planning Commission, which recommended it to Madhya Pradesh, Orissa and Bihar and other States where the economy largely depended on forests.

During the First Five Year Plan 589 Forest Labourers' Cooperative Societies were established and where necessary assistance and guidance were given. These generally proved successful. The Second Five Year Plan, therefore, further urged the State Governments to establish forest cooperatives in their tribal areas. It recommended not only to give forest contracts to such societies, but also proper assistance and guidance in the collection and processing for minor forest produce. Since the manner in which forest resources are exploited has great deal of bearing on the tribals' welfare, it was suggested that care should be taken to ensure that regulations relating to the collection of forest

produce, grazing, meeting every day requirements for firewood, etc., do not cause them hardship.

This objective of the State policy implied special care to ensure integrity on the part of officials, and proper coordination between the agencies (whether government departments or social institutions or the cooperatives) operating in tribal areas. For its aim was to enable the tribals to earn their livelihood consistent with their social life and cultural milieu, which constituted a vital part of welfare activities in such areas.

OTHER WELFARE AGENCIES

As a matter of fact, welfare in its broad sense includes various types of activities, which may be too diversified to be taken up by any single agency alone. Still, an agency at certain occasions may not like to delegate work assigned to it to any other institution or, for lack of coordination they could even work at cross-purposes. For instance in Madhya Pradesh, the Chhindwara branch of the Tribal Development Corporation, which took pains in the beginning to offer work to tribals at subsidised payments, had to suffer a loss for it was not given impetus by the Tribal Welfare Department to further continue such activities. It may, therefore, be suggested here that such welfare activities may well be left to the Tribal Welfare Department because such a State agency can only cope with these. However, departmental welfare activities can be only of a limited nature in their scope and application. A comprehensive scheme of welfare embracing every sphere of life, economic, educational and social, can be effectively implemented largely through tribals' own institutions like Forest Labour Coope-

rative Societies. These only need to be provided a proper footing and protection against hurdles which come in the way of their smooth working. This work would rightly come, within the statutory duties of the Tribal Development Corporation which being an apex body must take the societies with it in its working and not work as an independent body leaving aside the interest of the cooperatives. The functions of the Corporation will otherwise also remain limited if it ignores the societies.

What is immediately required of such a corporation is that it should provide employment to all the members of the societies. The Corporation can help the societies by activating those which have become defunct, and concentrating itself on commercial activities only, and not getting lost in the activities other than those which fall within its purview. It should also try to protect tribals against exploitation by the private agencies and contractors, by providing them sufficient work at reasonable wages and creating supplementary sources of income. This would ensure economic independence of the tribals. Rest of the welfare work may be arranged by the tribal community itself with the help of any other institution, if necessary.

The immediate task, therefore, is to augment *adivasis'* real income which alone would improve their economic status. The social services provided to the tribals by the Welfare Department and similar other agencies would be practically of no avail nor would it go a long way in increasing their standard of living if adequate means of income are not secured for the tribals. Further these sources of earnings should be perennial and permanent as to create a stable state of welfare. Thus the economic uplift through cooperatives, forest development and cottage industries, etc. should precede the far-reaching measures of social welfare like education, health and clothing.

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TRACTOR HIRING AND SERVICING PROJECT

—IT HAS FEW TAKERS

Yojana Staff Report By
A. M. PAKKAR KOYA

DESPITE an assurance of 100 per cent cash help by way of long-term loans and subsidies, only nine States have so far come forward to avail of the National Cooperative Development Corporation's scheme to set up servicing-cum-custom-hiring centres for farm equipment in the cooperative sector.

The reason? "Though our scheme got under way in 1968-'69, very few people know about it. Our mimeographed circulars and letters find their way to the Cooperative Departments and State Secretariats, where they are filed, forgotten or lost," said an official of the Corporation.

Important States so far not covered include Panjab, UP, West Bengal and Kerala. The matter, however, has been taken up. The scheme was brought to wider notice last year at Jaipur where co-operators from all parts of the country met. The Corporation has also brought out a booklet in English and Hindi giving the details of the scheme, with a view to helping farmers and others interested in setting up such centres.

The Corporation's scheme involves an outlay of Rs 10 lakh for each centre. The money needed for machinery, equipment, tools, workshops, two tractors, margin funds or securing bank accommodation and managerial subsidy for technical staff and other personnel are all provided by the Corporation to the tune of Rs 2.14 lakh as loan and Rs 0.75 lakh as subsidy. The only pre-condition is that a society should be able to raise Rs 25,000 from its members so that it can raise the requisite working capital from other sources. They are

required to put up the proposal to set up the centre to the National Cooperative Development Corporation through the State Governments. On being satisfied about the soundness of the proposal, sanction is communicated by the Corporation to the concerned State Government. The procedure for release of funds, etc., are given in the booklet.

According to the scheme, selected societies are to maintain about five

to ten tractors with matching equipment for purposes of hiring them out to the farmers. The Corporation provides assistance for the purchase of a nucleus fleet of two tractors. The society is required to purchase the remaining tractors with financial accommodation to be obtained from the Agricultural Re-finance Corporation or from commercial or cooperative banks or on hire-purchase basis from the State Agro-Industries Corporations.

INEXPENSIVE FAMILY PLANNING HEALTH PLAN ADVANCED

A comprehensive approach to family planning and maternal and child health care for the developing countries, costing only 60 cents per person a year, has been announced by the Population Council, USA. Based on a two-year study conducted by Dr Howard C. Taylor and Dr Bernard Berelson in nine nations, including India, the Plan is capable of averting millions of births in heavily overpopulated areas of the world and at the same time improving the health of mothers and children.

The total cost of the programme for all the developing countries with the exception of Mainland China, is estimated at a billion (thousand million) dollars a year. The key to the success of the proposed programme, particularly in the rural areas where health delivery is now lacking, is the training of midwives so that they can give professional care. Though physicians have to be there to guide the over all efforts, no great increase is foreseen in the number of doctors needed in these countries for the programme.

The blueprint for a programme would call for construction of new maternal child health centres (MCH). A major centre could take care of 100,000 people or about 4,000 deliveries annually. It would include 20 beds, clinics for family planning, one physician, five supervising midwives

and supporting personnel. Feeding into this centre would be a series of 25 sub-stations, each administering to 4,000 people or 160 annual deliveries. One auxiliary midwife, one village assistant and a family planning clinic would staff each of these sub-stations.

The urban facility, envisioned by the proposed plan, would serve 50,000 people with 2,000 annual deliveries and would have 20 beds, a family planning clinic, an obstetrician, three midwives, five auxiliary midwives and supporting personnel.

Schools would have to be established to train the additional midwives that would be required under the overall programme.

The six essential elements of the programme include two contacts with each mother prior to birth; provision for a trained attendant at delivery; three personal contacts after delivery; obstetrical and planning facilities which are accessible; a system of accurate records; and organised assistance from the village.

The plan relies on active support from the government of each participating country and its health ministry as well as acceptance at the village level along with wise use of facilities and extension of individual and community education.

CONCENTRATION OF ECONOMIC POWER

from Page 5

(e) A core sector which has been defined as industries in which gaps are likely to appear during the Fourth Plan has been introduced. This sector in which the Public Sector will be allowed to participate actively, will include, besides industries listed in 1956, as well as petrochemicals and electronics.

The new policy, which is a clear reversal of the earlier policy of delicensing, seeks to emphasise the basic objectives of licensing policy. It seeks to obtain some advantages of delicensing, without its disadvantage of uncontrolled entry of large houses into all industries. In the large industry sector, the bigger houses have not been barred and, in the absence of other applicants, they will be allowed to enter these basic industries. The net impact of these policy changes, if carried out conscientiously and efficiently, should help the small and medium sector as well as the private sector to grow more rapidly in the coming years.

Possibly, more than half the investment in organised industry takes place in the "heavy investment" sector, as defined in the new licensing policy. The exclusion of the large houses from this sector would, it might have been feared, retard industrial growth. The policy of discrimination, but not exclusion, avoids this danger. Moreover, with control over finance institutions, it should be possible for Government to influence share holding in units belonging to large houses to make them amenable to public control.

There are, however, some loose ends in the new policy which need to be tied up. First, the definition of small industry has been left unduly narrow, and no provision has been made for phasing out benefits and facilities in a gradual way so as to provide for transition from small industry to medium industry status. Secondly, while the sector upto Rs 1 crore investment has been made a semi-reserved sector, which should help smaller entrepreneurs to grow rapidly, watertight arrangements have yet to be worked out to prevent the larger houses from buying their way into this sector or entering it through dummy units. Finally, the expan-

sion of the sphere of the Public Sector is, in fact, no radical departure from earlier policy.

The crucial issue is that of compartmentalisation. The Government policy-makers should realise that under the existing circumstances it is not possible to achieve simultaneously the twin objectives of breaking the concentration of economic power and wealth, and inducing the large industrial houses to invest in core and basic industries. If the large industrial houses have to invest in industries requiring sophisticated technology larger investments will have to be made. This becomes difficult in the present concept of monopoly as enshrined in the Monopolies Act.

No enterprise or industry, whether private or public, can claim the right to exist in an economy like ours, which is striving to maximise output and employment. If private capital in any sector or industry fails to fulfil its role as an entrepreneur the State should not feel shy to make it mend its ways or end it if necessary. Private capital is neither sacrosanct nor is it a necessary evil. Its own performance, and nothing else, is its justification.

WATER MANAGEMENT

from Page 31

The rate of exploitation of water resources has been doubled in the Plan periods (First Plan nearly 17 per cent, and at the end of the Third Plan 33 per cent of usable supply). By the end of the Fourth Plan 45 per cent of the usable supply is likely to be harnessed. More than half of the surplus water potential would remain untapped even after 20 years of planned efforts, preceded by decades of unplanned, but by no means insignificant efforts in irrigation development.

In order to make use of the available water resources without much waste, the farmers should be given well developed equipments. Spring water led through small streams to cultivable fields gets soaked into the soil, percolates as free water into

the ground through crevices and holes. To avoid leakage through the bunds of the nullahs, a system similar to the one followed in Israel, may be introduced. It is the use of water pumps to irrigate the area without much waste from the source to the area to be watered. Instead of the traditional flood and furrow irrigation, the modern methods of spray irrigation, or sprinkler irrigation which is adopted in hilly areas (where coffee and tea are grown) may be made known to the entire agricultural community. Looking to the pressing requirements of irrigation facilities, this continued waste of water resources calls for more determined action by the planners.

Agriculture is not the only claimant of water. Industries also need huge quantities of water. The rapid increase in population will result in multiplying the domestic water requirements manifold. In planning our water resources, we have therefore, to look far into the future and assess the needs for irrigation, industries, domestic supply and other purposes for each region and the economic and physical availability of surface and ground water and the need for and economics of desalinisation of sea water. Only then we can prepare a plan and programme for the conservation and integrated utilisation of water resources in conformity with our requirements.

RECORD EXPORTS IN DECEMBER, 70

India's exports in December 1970 have recorded an all-time high of Rs. 151.27 crore. Exports in December were higher by nearly Rs 32 crore over that of the same month in 1969.

For the nine months, April-December 1970, exports have totalled Rs. 1,097.38 crore, Rs 54.42 crore more than the exports in the corresponding period in the preceding year. This increase works out to a growth rate of 5.2 per cent.

Imports in December 1970 amounted to Rs 132.26 crore. The cumulative total for imports in April-December 1970 works out to Rs 1,214.74 crore.

ECAFE :

Its contributions

THE twenty-seventh session of the Economic Commission for Asia and the Far East (ECAFE) is to take place in Manila from 20 to 30 April, 1971.

ECAFE, which came into existence in 1947, is one of four regional Commissions set up by the U.N. Economic and Social Council (ECOSOC). It has at present 31 full and associate members. The member countries are, Afghanistan, Australia, Britain, Brunei, Burma, Ceylon, Fiji, France, Hong Kong, India, Indonesia, Iran, Japan, the Khmer Republic (formerly Cambodia), Korea, Laos, Malaysia, Mongolia, Nepal, the Netherlands, New Zealand, Pakistan, Papua (New Guinea), the Philippines, Singapore, Taiwan (Formosa), Thailand, USSR, US, Vietnam and Western Samoa. Two other countries that have applied for membership are Tonga and the British Solomon Islands Protectorate.

ECAFE has its permanent headquarters in Bangkok, under the direction of an Executive Secretary. Annual sessions of the full Commission are held in different countries, while its various specialist committees and working parties meet throughout the year. The secretariat, in co-operation with other UN agencies, undertakes the financial and administrative servicing of regional projects requiring technical assistance. The Secretariat also publishes an annual Economic Survey of Asia and the Far East, which forms the basis for planning the Commission's programmes. Since 1969 it has begun publication of a Statistical Year Book for Asia and the Far East.

ECAFE is involved in a wide field of economic activity in the region including development research and planning; trade promotion; fostering of industrial, agricultural and communications development; population and social studies; and

training in administration and statistics. Technical assistance projects are undertaken with funds from the regular UN budget and from the UN Development Programme (UNDP), which is financed through voluntary contributions from member governments. ECAFE does not itself distribute capital aid, but it has helped to set up and attract funds for regional development projects, for example, through its sponsorship of the Asian Development Bank.

The Bank, an independent and autonomous body, has 21 regional and 14 non-regional countries as members. With its headquarters in Manila, it began its operations in 1966. It has an authorised capital of 1,100 million U.S. dollars. Up to the end of last year, the Bank gave 43 loans, amounting to 329 million dollars, to nine countries. It also approved another 16 loans, for a total sum of 55.7 million dollars, out of a multi-purpose special fund set up in 1968 to provide soft loans, in addition to the normal operations of the Bank.

Asian Highway

Another major ECAFE-sponsored regional project is the Asian Highway, which aims at establishing a direct road link from Iran to Vietnam, with a network of motorable roads connecting 14 countries with it. By the end of 1970, nearly 90 per cent of the main Iran-Vietnam route was completed. Also about 48,000 kilometres representing 80 per cent of the network was completed with all-weather motorable roads.

The development of the Lower Mekong Basin is yet another ECAFE contribution. The project is supported by 26 countries as well as by UN agencies, for which resources totalling about 200 million dollars have so far been pledged. The project is intended to promote the all-round development of the Lower Mekong River Basin, including the generation of hydro-electric power, development of irrigation facilities, flood control, drainage, navigational improvements, watershed management and water supply, together with related economic and social growth.

The Asian Institute for Economic Development and Planning was also established on the initiative of ECAFE in 1964. By the end of 1970 the Institute had provided training for more than 1,200 students from 25 countries in the region. A new research wing was also opened. Among other things, ECAFE set up the Asian Coconut Community, the Asian Statistical Institute and the South East Asian Iron and Steel Institute.

Besides, the Commission convened Asian Ministerial Conferences in 1963, 1965 and 1968. At the last Conference it was decided that the conference should, in future, serve as the Council of Ministers for Asian Economic Cooperation. The Council met for the first time in Kabul in December last year. At this meeting the Council adopted what is called the 'Kabul Declaration' calling for a series of cooperative activities, including consideration of an Asian Clearing Union, regional trade expansion and an Asian Reserve Bank.

ECAFE has supported two successful Asian International Trade Fairs, held in Bangkok in 1966 and Tehran in 1969.

UN Committee Adopts World Plan

An advisory committee of the Economic and Social Council has approved a World Plan of Action designed to overcome obstacles to development through application of new knowledge in the fields of science and technology.

The Committee has singled out approximately 15 critical areas where the acquisition of new knowledge through basic and applied research appears to hold particular promise.

These areas include cereals, edible protein, fish, pest and vector control, tropical hardwoods and fibres, ground water, desalination, arid lands, natural disaster warning systems, indigenous building and construction materials, industrial research and design, and human fertility.

The World Plan represents the Committee's main contribution to the Second Development Decade.

THE Board on Awards for Import Substitution has in April this year announced eighteen awards for substitution of imported items. These include three cash awards totalling Rs 3,500, one Silver Shield, five Bronze Shields and nine Certificates of Merit. No Gold Shield has been awarded this time.

Established in 1967, the Board gives cash awards to individuals or groups and shields to institutions and organisations. In the latter case, the individuals responsible for the development of the product are awarded Certificates of Merit. These awards are made twice a year. The Board has so far given one Gold, 9 Silver and 24 Bronze Shields, cash awards totalling Rs 88,000 and 42 Certificates of Merit.

This time the Silver Shield has been awarded to Bharat Industrial Corporation, Calcutta, for indigenous development of a Briquetting Plant for making low priced fuel briquettes from coal dust for house-hold

AWARDS FOR IMPORT SUBSTITUTION

use. This development, by Mr Prem Goyle of Bharat Industrial Corporation, has effected a recurring annual saving of over one million rupees on capital equipment, besides helping in the utilisation of an abundantly available industrial waste piling up at steel mills and collieries.

Messers Masvy & Co. Pvt. Ltd. of Poona have been given a Bronze Shield for developing an Aero-engine Removal and Transportation Stand meant for overhaul and repair of Boeing aircraft engines. It can be assembled quickly and has easy mobility in workshops and hangars. This development has resulted in a foreign exchange saving of over Rs 6 lakh.

Messers Instrumentation Ltd of Kota (Rajasthan) have been awarded a Bronze Shield for substituting Throw-away Thermocouples suitable for steel industries and high temperature furnaces. The indigenous

thermocouples, available in the form of cartridges, are likely to effect a saving of about Rs 1.6 lakh in foreign exchange annually. Messers Mukand Iron & Steel Works Ltd. of Bombay also get a Bronze Shield for indigenously developing Thermocouples of special composition. This development has enabled the company to avoid changing their existing pyrometric instruments.

Messers Industrial Electronics Pvt. Ltd., Bangalore, have won a Bronze Shield for substituting Micro Limit Electronic Comparator comprising a measuring head for linear motion, a highly stabilised oscillator, an amplifier, a phase-sensitive detector and a meter for visual indication. It costs only Rs 5,500 as compared to the imported price of about Rs 15,000. It is expected to save Rs 7.5 lakh in foreign exchange annually.

Messers National Fluorine Corporation, Thana (Maharashtra) have been awarded a Bronze Shield for developing indigenous know-how and plants for the manufacture of a number of inorganic fluorine compounds. An estimated annual saving in foreign exchange of Rs 6 lakh is expected from this development.

Dr Mohamad Khalilullah of Poona has been awarded Rs 1,500 for developing a Cardiac Monitor, an audio-visual indicator and alarm system for heart pulses. It can be used by heart patients in conjunction with a cardiac pacemaker. The indigenous monitor, which is available at half the price of the imported product, is likely to effect an annual saving of Rs 28 lakh in foreign exchange. Dr Khalilullah gets another award of Rs 1,000 for developing a Cardiac Pulse Generator (pacemaker), useful for patients suffering from heart attacks. It is priced at Rs 700 as against Rs 4,000 for the imported unit. The estimated saving in foreign exchange from this development is Rs 4 lakh per annum.

Mr Amiya Kumar Chakrabarti of Hindustan Steel Ltd., Durgapur, has won an award of Rs 1,000 for developing a Magnetic Particle Testing Machine suitable for testing very heavy iron castings. The Development of this machine has saved Rs 65,000 in foreign exchange to the Hindustan Steel.

T. V. TOWER

from Page 9

(In filling export orders, the steel cutters at Kamanis have to be extra careful. In the US and elsewhere where labour for dangerous high-rise construction comes expensive, most of the joining-up has to be done on the ground. The finished sections are then hoisted by cranes and helicopters and fitted into position. This is an operation which allows absolutely no variation in alignment. The slightest miscalculation would render the whole shipment useless.)

Talking about the future of such specialised constructional work in the country, K.K. Verma, a senior engineer of the Kamanis with considerable experience with A.E.I., Westinghouse and other leading U.S. and British engineering firms, said: "So long as there is growth and development in other sectors, construction will thrive. But ours is a special field. We need steel, in quantity. We have to keep scores of construction teams all over the country happy with work. We have invested extensively in equipment. And, our jobs depend on the development of electric power transmission in the country."

But of late, Kamanis have been branching out into other fields, mostly manufacturing. They include copper and brass tubing, other non-ferrous metals, metallic oxides, industrial X-rays, gamma rays and ultrasonics, household meters and industrial jewels.

And this diversification, along with intensive efforts at capturing and retaining foreign markets, (they have had repeat orders from many of their foreign buyers), is something that has paid the group handsome dividends. Their exports to 32 countries in Europe, South-East Asia, Middle East, Africa and the Americas have exceeded Rs 370 million. Kamani Engineering Corporation holds the FICCI Award for "Outstanding" performance in the export of non-traditional items for the current year.

News from Rajasthan

Educational Progress

The number of primary schools in Rajasthan has gone up to 18,930 in 1970-71, while that of upper primary schools has increased to 1,999, and of secondary and higher secondary schools to 1,034. At the beginning of the First Five Year Plan, there were only 4,336 primary schools, 732 middle schools and 175 secondary schools in the State. There were only 27 colleges for higher education in 1951. Their number now stands at 83. As regards professional colleges of various types, their number has gone up from 21 to 47 in 1970-71. Besides, there are also 23 colleges and schools for technical education, two engineering colleges, 6 polytechnic schools and 160 Industrial Training Institutes.

The percentage of school going children in various age groups has also gone up during these years. While the percentage of boys and girls in 6-11 age group was 26.05 and 5.7 respectively in 1950-51 it became 80.7 for boys and 30.9 for girls in 1970-71. The percentage of boys and girls belonging to 11-14 age group also rose from 8.9 and 1.6 respectively in 1950-51 to 40.8 and 10.4 in 1970-71. In the 14-17 age group the percentage was 3.1 for boys and 0.5 for girls which went up to 19.4 for boys and 4.1 for girls.

During 1950-51, a sum of Rs 21,500 lakh was spent on various types of education which rose to Rs 967.31 lakh in 1960-61, Rs. 1,927.50 lakh in 1966-67 and Rs. 3,857.46 lakh in 1970-71. A total amount of Rs 1,565 lakh has been set apart for meeting expenditure on different fields of education, under the Fourth Plan.

* * *

Small Scale Industries

In Rajasthan, the small scale and cottage industries have made commendable progress during the last 15 years. Of the 7,233 small-scale units in the State, 2,930 are engaged in manufacturing engineering goods, precision instruments and other varieties of sophisticated articles.

The Small Industries Corporation, with an authorised share capital

of Rs 25 lakh, has been making an all-out effort to meet the ever increasing demands from its various units. The Corporation procures and supplies raw materials to the small industries units through its raw material depots working at Jaipur, Jodhpur, Udaipur, Kota, Bikaner, Churu and Nagaur. The Corporation participated in the International Autumn Fair in Yugoslavia and 'Partner for Progress' exhibition in Berlin (W. Germany).

Attention has also been devoted to the Rural Industrialisation programme. Two worsted woollen spinning mills have been established by the Corporation. The Churu Mill started functioning in November, 1967 and the Ladnu Mill in January, 1968. Each plant consists of 400 spindles; the capacity can be raised to 1,200 spindles.

A marketing assistance scheme has been introduced to provide necessary help to the small units in marketing their goods. A number of items have been reserved for purchasing exclusively from the Small Industries Sector. Other facilities being provided to the small scale industries relate to production for export training in various profe-

ssions and vocations, technical and marketing advisory training in production management, marketing and financial management etc. The State Government has also set up a well equipped laboratory to provide testing facilities for the products manufactured by the units. This would help them to maintain quality control for their products.

Soil Conservation

The Rajasthan Government has fixed a target of 2 lakh hectares of land to be covered under the Soil Conservation Programme during the Fourth Plan period. A sum of Rs 132 lakh has been earmarked for the purpose. Of this, Rs 16.50 lakh have been set apart for 1970-71 when 40,000 hectares are proposed to be covered.

Soil conservation work has also been included under "Scarcity Works" in different parts of the State.

In 1969-70, nearly 20,000 hectares were covered under the normal soil conservation programme and about 18,000 hectares in the famine areas.

The soil conservation programme over cultivated land is being implemented by the State Agriculture Department and over forest land by the Forest Department.

OUR CONTRIBUTORS

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Before you have another child **think**



wouldn't you first
like to give this child
all the care she needs?

Life-giving milk. The clothes, the toys, the books...all the things you want to be sure she gets. But if another child should come along too soon, this may not be easy. Wouldn't you prefer to avoid this? Millions of couples all over the world are doing just that. They put off having another child till they are ready for it. You too can do so with NIRODH. It's the world's most popular rubber contraceptive for men because it's so safe and simple to use. Why not buy a packet today? Available everywhere at only 15 paise for 3 because it is subsidised by the Government.



Until you want another child, use
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the safe, simple rubber contraceptive millions choose

Sold by: General Merchants, Chemists and Druggists,
Provision Stores, Pan Shops, Etc.

10/500

BOOKS

Facets of Federal Finance

Indian Federal Finance and Budgetary Policy by Dr B.N. Gupta. Published by Chaitanya Publishing House, Allahabad. Pages 467; Price Rs 35.

N. C. Joshi

With the adoption of the objective of building up an egalitarian society, writings on governmental finance, involving income and expenditure, have become exciting. Such writings are expected to unfold new lines of thinking on the subject. In a federal structure like ours, the process of reconciliation of conflicting claims of the Union and State Governments *inter se* must be dynamic and consistent with the economic objectives. Budgetary policy of the Government becomes an important instrument in such a process. In the book under review the author has tried to describe various facets of federal finance classified under 14 chapters. These chapters contain views of Indian as well as foreign experts. However, it is not a research-oriented study and is at best a text-book meant for those who want to understand public finance in the Indian context. With the amount of pains taken by the author, perhaps it would have been worthwhile to probe into a particular aspect or aspects of the wide field of federal finance and suggest policy prescriptions to be incorporated in future planning. Otherwise such a painstaking work becomes nothing but another addition of a text-book on public finance where there already exist so many.

In the last chapter on Financial Reforms in India the author remarks that "we were so much after the grandiose or prestige projects that many essential services suffered on account of them. For example, the Government spent more on steel plants than on agriculture or education." I believe many economists would not agree with this view. This generalisation is not supported by any statistical enquiry and is a

misplacement of facts. It is not a sound proposition to say that only agriculture and education are 'essential services' and steel plants do not help in creating them. In the same way, elsewhere also, several *obiter dicta* have been made by the author.

On the question of budgetary policy the author feels that "there is need to reorient the budgetary policy of the Government of India so that the present economic crisis may be effectively solved and the country may progress at a rapid pace." However, no definite measures for improvement have been indicated. What the Philippine President said for his country in 1966 has been recommended by the author as a guideline for India

also. Unfortunately, they are no guidelines but mere high-sounding political aims devoid of any practicability.

The chapter on Financial Administration and Procedure has been exhaustively dealt with and gives a good insight into the role of parliamentary committees doing the job of checks and balances in matters of finance. However, the subject of finances of public undertakings has been given a perfunctory treatment. The matter given there is just what the Annual Report of the Bureau of Public Enterprises contains. Such a subject, if handled with objectivity and examined analytically, becomes more welcome even to a casual observer.

The appendix contains recommendations of the Fifth Finance Commission. The bibliography is useful.

Candid Approach to Labour Problems

Labour Problems and Industrial Development in India by D. Sanjivayya. Published by Oxford and I.B.H. Publishing Co., Pages 283; Price Rs 32.

Industrial Relations in Selected Units, by R.C. Saxena, Published by the Research Programme Committee, Planning Commission. Pages 223; Price Rs 26.

M. M. Bhalla

The articles and speeches collected in the first volume come from a highly experienced hand, they touch a vast and complicated field and deal with varied issues related to labour problems and industrial development. Speeches delivered at the Indian Labour Conference and the International Labour Organisation along with articles on Nehru's faith in economic development and industrialisation as media of integration constitute the first chapter. The reader is then gradually led through innumerable serious issues like import substitution, labour and productivity, joint management coun-

cils, agricultural labour and finally to the problems of specific industries like chemical industry, drug industry and so on.

A pronounced feature of the book is the genuine concern which it reveals to solve the multifarious problems as they emerge in highly dynamic but complex situations in actual practice. The author is, therefore, invariably candid in his approach to comprehend the different issues and suggest plausible remedies without indulging either in polemics or politics. For example, he strongly advocates the provision and maintenance of welfare measures but hurriedly goes on to add that "lavish spending on welfare measures do not do the trick of achieving harmonious industrial relations". Referring to the public sector, he points out that there has been greater awareness in recent months to improve the standards of compliance with labour laws and admits that "there is room for improvement to secure better standards of compliance."

Mr Sanjivayya has had intimate association with problems of labour

and industries, particularly in his capacity as Minister for Labour and Employment and then as Minister for Industries. The book, therefore, reflects his vast experience and also leaves an imprint of his being a spokesman of government policy. The different issues have been discussed under the framework of existing policy and the likelihood of certain changes that may take place at the time when he made a speech or wrote an article. With this perspective it is highly refreshing to go through these articles and speeches which have been written in a very lucid style.

The other book under review is a case study sponsored by the Research Programme Committee of the Planning Commission and conducted in five industrial units in Meerut with objectives of explaining "why interests and attitudes conflict and how these conflicts are compromised and what new issues are emerging out for the future."

The author finds "the presence of comparatively good trade union in these industrial units." But one does not understand the nature of this "goodness" since he does not elucidate but merely refers to lack of welfare facilities, lack of proper working hours, workers' ignorance of the code of discipline and absence of rational recruitment or promotional channels. In addition, we are told "wages are low and housing leaves much to be desired". In spite of all this the author informs us of the harmonious relations existing in these units.

The planning Commission sponsored this project in 1962. This is a work of 8 years. One wonders what use the Planning Commission or anybody else can make of this book.

TO AUTHORS AND PUBLISHERS

Authors and Publishers who desire their books to be reviewed in YOJANA are requested to send two copies of each publication to us.

Methodology of Economics

The Methodology and Scope of Economics by Ashalata Bose. Published by Bookland Private Ltd. Calcutta, Pages 73; Price Rs 6.

B. N. Nair

Massive performance on the economic front in India postulates not merely an economic administration endowed with functional efficiency and rectitude but also an academics that is, palpably, imbued with the ethico-social values of a renovated economic philosophy, more in the nature of the sure grasp of economic theory and methodologies rather than the unthinking adherence to any lump of economic ideology as such. If theory is not to be sundered from practice and social reality is not to be merely simulated in a half-hearted manner for policy formulation or model building, there is need for greater homework to be done by all concerned. Otherwise, this unfinished business of accepting and rejecting theories, without any certainty about their hidden values or the understanding of their methodology, is bound to land the economists' profession in India into utter disrepute. This appears to be the cardinal idea behind the author's intellectual effort and represents its message. Perhaps, it is also the moral to be drawn from this modest, if thought-provoking, timely and welcome study.

The book is divided into three chapters, with a discussion over 'the place of ethico-social values in economics' being followed by an appraisal of 'the problems of methodology' in two parts. The uses of the so-called scientific method have been contrasted with the mathematical and statistical methods, with their relative strong and weak points highlighted with the help of expert opinions of scholars. Critical views have also been expressed about the econometric method with a brief outline of social accounting. These are, however, both perfunctory and inadequate as they fail to explain the rationale for their current vogue, that also serves to restrict the value base of economics and its methodo-

logy, while deceptively making claims to the contrary.

The author largely relies on the excerpts of the writings of the well-known writers for the discussion of the methodology and scope of economics and does not always either convey the impression of having synthesised their viewpoints or as having formulated views of her own. Nevertheless, the author's approach bears the mark of earnestness and sincerity of her social purpose. By addressing herself to the larger questions of the limitations of the methodology and scope of western oriented economics as well as economic theories and policies of development under Indian conditions, the author might have not merely filled up the gaps in her own empirical frame of reference, but could have also produced a more useful tract of considerable current relevance than the present one. Nevertheless, with a proper rearrangement of ideas in a revised edition, the book is bound to be useful to undergraduates of Indian Universities and can, indeed, also fulfil a long-felt need of the economists in India who are eager to don the mantle of social scientists.

Science of Decision Making

Managerial Economics by R.L. Varshney & K.L. Maheswari. Published by Sultan Chand & Sons, Delhi. Pages 300; Price Rs. 11.

S. Radhakrishnan

Managerial Economics is a recently developed interdisciplinary behavioral science, which has practical application in the business world. It is micro economics with principles from statistics, mathematics and accountancy applied to certain business situations at the firm or industry level. It is a practical oriented study which helps managers in decision making.

With profit maximisation as the sole objective of a firm or industry, the business manager has to be armed with the necessary tools of analysis in deciding the price or the volume of production under different market

situations. The variables involved in decision making are many and where they can be quantified, the analytical tools do help in a fair measure to take business decisions which produce results not-too-far-off the mark. With profit maximisation as the objective function, the manager has to be familiar with forecasting demand for his product and depending on the market situation he finds himself in, decide on the level of output or price. Business decision making has become so scientific that one need not go either by intuition or some rough rule-of-thumb method. Closely related to the problem of pricing and output is the appraisal of projects from the point of their profitability.

The book, elementary though, is a good introduction to this vital branch of business economics. The concepts such as forecasting demand, breakeven point, project appraisal, budgeting etc. have been explained with clarity and simplicity, with examples drawn from Indian situations. To those initiated in mathematics, here is an important branch of study of practical value which can be learnt without tears.

Survey of World Events

The Contemporary World by William H. Mcneil The University of Chicago. First Indian Reprint—Published by Vora and Co. Bombay; Pages 177; Price Rs 5.

M. K. Dharma Raja

This is a survey in bold outline of events beginning with World War I—right upto the threshold of the seventies. Though the author let for himself the confounding task of etching into a global canvas and into proper perspective such a bewildering array of events, he has turned out a splendid and authentic account of the history of our times. He has given us a world survey with the main global trends succinctly summed up through a kaleidoscopic spectrum. A scathing criticism of the Versailles Treaty, an analysis of the conformation between Leninism and the Wilsonian forms of socio-polity and the con-

flicting socialist revolutions as opposed to nationalist revival wedded to efforts at evolutions—all these provide an insight into the world between the two wars. This treatment facilitates an easier understanding of the shift in emphasis from the dynastic or imperialistic to the economic and ideological motivations for expansion that triggered the 1939 war. Peace, allied discord, the emergence of independent Asian and African nations, political polarisation and the arms race are all recent history still unfolding itself.

A distinctive feature of this study is the attention devoted to the social, cultural and literary trends in contemporary history. Briefly described here also is the progress of science. A series of pictorial essays after each chapter with brief biographies of leaders of thought and action ranging from Lenin, Picasso, Freud and Einstein to Gandhi—and also Hitler, Mussolini and Mao-Tse-tung—are among the useful features of this miniature compendium.

SOME SUGAR FACTS

Although sugarcane originated in the South Pacific Island India was the first country to develop the art of sugar production from the cane, according to some U.S. Agriculture Department researchers.

In a new publication—"A History of Sugar Marketing"—they fix the date of the origin of the new industry as not later—perhaps earlier—than 400 BC. Then it gradually spread Westwards to Iran, Asia Minor Egypt and across North Africa to the Atlantic as well as to Southern Europe. It was after nearly 2,000 years that sugar manufacture appeared in the South Pacific Island.

Sugarcane reached the Mediterranean in the seventh or eighth century through Muslims who became acquainted with it as a result of their conquest of Persia while the Christian Crusaders helped the spread of sugar in Europe.

Introducing A Proud Heritage

Indian Handicrafts, Publications Division; Ministry of Information & Broadcasting, Government of India. Pages 72; Price Rs 4.50.

S. Prasad

This excellent brochure serves as a much-needed introduction to a proud heritage. As the blurb says, our handicrafts have a glorious tradition. "Unsurpassed for their artistic excellence and superb workmanship, they have a freshness, vitality and charm all their own, and are highly prized the world over". The book, with several illustrations on art paper, serves to bring out the rare beauty of the various crafts practised by our artisans for centuries. The thirteen short chapters, running the entire gamut, from textiles to toys, take us on a breath-taking journey of exotic colours, born out of the flamboyance peculiar to our land. One gazes with wonder and awe at the *kinkhab* of Varanasi, the *Himru* fabrics from Hyderabad, the *amlakar* shawls of Kashmir, the *Phulkari* from Punjab, and the embroidered mirror work from Rajasthan, to mention a few. And then one steps into another world of gorgeous colours, of carpets and rugs from the north and the south, blending softness with richness. The second half deals with metalware, stone carving, and ivory and woodwork, among other things. Of these, ivory takes the pride of place not only because of the delicacy of its colour, but also because of its exclusiveness. An excellent print of a carved ivory casket from Delhi bears testimony to the amazing skill of the craftsmen.

What of the future? That skill of such high order should languish for want of patronage is a disturbing thought. The last chapter, dealing with this aspect suggests the formation of artisans guilds, as in the past. The more important thing is to modernise this art. But in any commercialisation it will be necessary to ensure that there is no erosion of the basic skills.

RESEARCH INSTITUTE OF TELE-COMMUNICATIONS TOHOKU UNIVERSITY, SENDAI, JAPAN SCHOLARSHIPS—1971-72

Applications are invited from Indian nationals and subjects of Sikkim for the award of one scholarship offered by the Research Institute of Tele-Communications of Tohoku University, Sendai, Japan, for post-graduate research in Electronics, Electrical Engineering and Tele-Communication Engineering.

DURATION: One year from October, 1971.

VALUE: Yen 38,000/- (Rs 790/- approx.) per month plus a subsidy of Rs 750/- per annum for study tours and books.

PASSAGE: The cost of passage to and from Japan will be borne by the scholar and/or his employers, if any.

QUALIFICATIONS: (a) First class degree or equivalent diploma in Electrical Engineering/Tele-Communication Engineering/Electronics OR a first class M.Sc. degree in Physics/Applied Physics with specialisation in Electronics and (b) three consecutive years' experience, preferably in research/development/teaching in Electronics or related fields after obtaining the aforesaid qualifications.

Preference will be given to the candidates knowing the Japanese Language.

AGE: Not more than 35 years as on 31st May, 1971.

LAST DATE for receipt of applications: 30th April, 1971

LAST DATE for supply of application forms: 24th April, 1971.

For prescribed forms and other particulars, write with a self-addressed unstamped envelope (23 cm x 10cm) superscribed "RESEARCH INSTITUTE OF TELE-COMMUNICATIONS OF TOHOKU UNIVERSITY, SENDAI, JAPAN, SCHOLARSHIPS- 1971-72, to:

MINISTRY OF EDUCATION AND YOUTH SERVICES, GOVERNMENT OF INDIA, SECTION E.S.I., EXTERNAL SCHOLARSHIPS DIVISION, SHASTRI BHAVAN, 'B' WING, 5TH FLOOR, NEW DELHI-1.

AUSTRIAN GOVERNMENT SCHOLARSHIPS 1971-72 IN TOURISM AND HOTEL MANAGEMENT AT THE INSTITUTE OF TOURISM AND HOTEL MANAGEMENT AT SALZBURG, AUSTRIA.

Applications are invited from Indian nationals and subjects of Sikkim for the award of unspecified number of scholarships in Tourism and Hotel Management in Austria.

DURATION: Eight months from October 7, 1971 to May 26, 1972.

CONDITIONS OF ELIGIBILITY: Candidates must have passed Higher Secondary School Examination or equivalent examination. Professional training and practical experience in tourism (hotels, travel agencies, tourist management) is essential.

Candidates must have successfully completed a course of training in one of the Catering Institutes in the country and in proof of that, they must produce satisfactory evidence in original from the authorities concerned.

PASSAGE COSTS: Candidates will have to bear their own travel expenses to and from Austria.

SUBJECT: Tourism and Hotel Management.

AGE: Between 21-26 on 1st October, 1971.

ESSENTIAL: Perfect knowledge of spoken and written English.

VALUE: Every student is granted a monthly allowance of Austrian Schillings 1,000 (Rs. 280/-) which usually cover expenses for bed and breakfast only. Each participant will therefore have to provide himself additional Austrian Schillings 1,200 to Austrian Schillings 1,500 (Rs 342/- to Rs 428/- approximately) *per month* according to his personal standard. At the beginning of the course another Austrian Schillings 1,500 (Rs 428/- approx.) will be needed to cover expenses for books, personal requirements and municipal registration fees. The amounts mentioned above will have to be paid in foreign exchange.

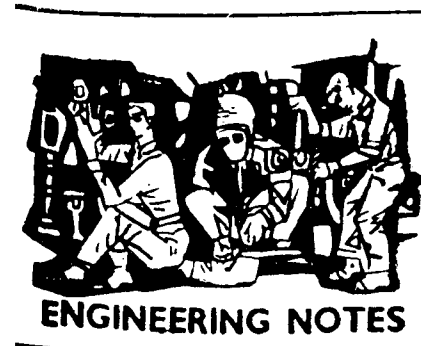
ACCOMMODATION: For the students double-bedrooms will be booked in the neighbourhood of the Institute. The monthly rent of Austrian Schillings 600—(Rs 171/-approx.) to Austrian Schillings 800 (Rs 228/- approx.) per student is to be paid from the monthly allowance.

Last date for supply of application forms is 28-4-1971 and last date for receipt of complete applications is 5-5-1971.

For prescribed application forms and other particulars please write enclosing an unstamped self-addressed cover (23 cmx10cm) to the Ministry of Education and Social Welfare, Government of India, E.S.I. Section, Shastri Bhavan, Room No. 514, 'B' Wing, 5th Floor, Dr. Rajendra Prasad Road, New Delhi-1.

The envelope should be superscribed "Austrian Government Scholarships in Tourism and Hotel Management, 1971-72."

Note: Only those candidates may apply as would be able to furnish guarantee of funds to the extent of Rs 3,500/- for the eight months' course and Rs 4,000/- for both ways Air passage i.e. a total of Rs 7,500/-



KARMAVIROTTAMA AWARD FOR ADVANCEMENT OF TECHNOLOGY

THE ASSOCIATION OF ENGINEERS, INDIA, would confer *Karmavirottama* title on eminent persons who have contributed for the advancement of technology, theoretically or practically, according to an announcement in the Association's *Bulletin*. The Association's Council would receive nominations from individuals, learned societies, institutions and Government organisations. All correspondence, in confidence, to the President of the Association, 24, Netaji Subhas Road, Calcutta-1.

BHARAT HEAVY ELECTRICALS LIMITED, Tiruchirapalli, has manufactured a high pressure boiler drum for the Tunku Ja'afar Power Station in Malaysia. The 46-tonne drum with 150 nipples welded on to it involving the specialised electrolag welding process for the longitudinal seams, is a first for the plant. It was despatched to Malaysia on 4th April, 1971. In March this year, BHEL has signed a technical collaboration agreement with Combustion Engineering, Inc., of USA.

A RADIO TRACER LABORATORY has been established at the Central Electro-Chemical Research Institute, Karaikudi, to study various corrosion inhibitors, passivation of metals, mechanism of depassivation by corrosive ions like halides and the phenomenon of pitting corrosion. The action of brightening agents in electroplating and growth of electro-deposits also form part of the programme of investigation.

MESSRS MINE SAFETY APPLIANCES LIMITED, Calcutta, reports the successful commercial production (13,000 units valued at Rs 56,000 in about two years), of a new type of carbon monoxide detector, developed and released for commercial exploitation by the Central Mining Research Station at Dhanbad. The detector, engineered around an impregnated silica gel column, can be used in mines, tunnels, sewage treatment plants, garages, hangars and factories.

HEAVY ELECTRICALS (INDIA) LIMITED, Bhopal, has exceeded the target set for 1970-'71 for transformer production. It has already produced transformers worth Rs 610 lakh as against the target of Rs 600 lakh. During March alone, the Industrial Machines Division of HEIL got orders worth Rs 29 lakh for AC induction motors. Atomic Power Stations at Kota and Kalpakkam, along with the Railways, are the main buyers.

THE SINDRI UNIT OF THE FERTILISER CORPORATION OF INDIA has fabricated a stainless steel crystalliser for the ammonium sulphate plant. Except for the stainless steel, all other materials were procured indigenously. The crystalliser has 20 nozzles of varying dimensions. In fabricating a vessel of this type, skill of a high order is needed for the perfect alignment of different parts, accu-

racy in the orientation of nozzles, strict flow of current at the time of welding, screening and grinding and polishing of wells. Though radiography is not mandatory for such jobs, the welds, particularly the Tee joints, were tested by radiography for perfection and quality.

GARDEN REACH WORKSHOPS, at Ranchi is well on the way to completing the first ever marine diesel engine to be manufactured in India. At present, the workshop uses 50 per cent imported components and the rest is Indian. Set up with technical collaboration with MAN of West Germany, the Ranchi factory will produce three types of marine diesels. These are, (a) low speed engines with 110 to 120 rpm developing 9,000 to 12,000 BHP for ocean-going vessels and defence purposes; (b) medium speed 420-430 rpm engines developing 1,000 to 1,200 BHP for dredgers, trucks, etc., and, (c) high speed 1,200 to 1,800 rpms with 300 BHP for use in stationary installations like power generators, drilling rigs, etc.

A NEW SAW BLADE FOR LIGHT METALS which cuts without burrs and is said to last longer without regrindings than conventional high speed steel saws has been developed in Sweden.

Intended principally for use on aluminium and other non-ferrous metals, the new saw blade—designated Micor—features securely brazed carbide tins, the cutting geometry of which is said to eliminate adhesion on the sides of the blade.

A cutting speed of up to 100 m/sec. can be obtained with the new saw blade, which can last up to 25 times as long as high-speed steel blades. This durability, combined with a higher feeding speed, is said to make the new saw blade considerably more economic than conventional alternatives.

Development Diary

Regd No: D-876

* A scheme to help small borrowers in the priority and neglected sectors has become operative. It will cover traders in fertilisers, transport operators and people engaged in agricultural operations, among others. Under the scheme, credit facilities extended to them by scheduled commercial banks will be covered by guarantees provided by the Corporation set up for this purpose.

* An agreement has been signed under which the United States will supply 15 lakh tonnes of wheat, over 2 lakh bales of cotton and 75 thousand tonnes of vegetable oil of the value of Rs 112.5 crore to India.

* Coffee production in 1970-71 is estimated to have totalled 95,000 tonnes, an all-time record. The previous record was 78,000 tonnes in 1967-68. The Coffee Board is making special arrangements for storage and curing to meet the additional output.

* India and the Soviet Union have signed an agreement providing for the supply of 20,000 tonnes (1.1 lakh bales) of raw cotton annually from the Soviet Union which would be converted into cotton textiles in India for re-export to the Soviet Union.

* The Union Ministry of Irrigation and Power has sanctioned a further loan of Rs 85 lakh to the Electric Supply Undertaking of the Municipal Corporation of Delhi for meeting expenditure in connection with their approved power development schemes during the current financial year.

* India's exports in January 1971 totalled Rs 143.72 crore and imports Rs 157.10 crore. For the ten-month period, April 1970-January 1971, exports amounted to Rs 1,241.10 crore as against Rs 1,187.98 crore during the same period in 1969-70, showing a rise of Rs 53.12 crore.

* Three new Research Institutes in Meteorology have started functioning. One of the Institutes, meant for astrophysics is located at Kodaikanal. The second meant for Geomagnetism is at Colaba in Bombay. The third dealing with Tropical Meteorology is at Poona.

* India and Canada have signed two agreements for Canadian development loans worth Rs 30 crore on the usual soft terms granted for all Canadian development loans to India. While one loan for Rs 28 crore will be used during 1971-72 to finance the import of industrial commodities, fertilisers and fertiliser materials, the second of Rs 2 crore will be used by the Oil and Natural Gas Commission.

* The Research, Designs and Standards Organisation of the Railways has designed and developed a prototype of the latest heavy duty 1,500 volt DC freight locomotive of 4,200 HP for use on the Ghat sections of the Central Railway. Indigenously manufactured, the 25 K.V AC mixed locomotive, capable of speed upto 120 kilometres per hour on passenger and 100 kilometres per hour on goods trains is ready for test.

* The Ministry of Irrigation and Power has sanctioned a loan of Rs 35 lakh to the Government of Assam for meeting expenditure on the Centrally-sponsored schemes of Inter-State Transmission Lines, during the current financial year. Of the above amount, Rs 25 lakhs are for the 108 km. long Alipurduar (West Bengal)—Bongaigaon (Assam) 132 kV S/C line and Rs 10 lakh for the 64 mk. long Badarpur (Assam)—Jirighat (Manipur) 132 kV S/C line.

* India earned Rs 48 crore of foreign exchange through the export of cashew kernels and shell liquid from April 1970 to February 1971.

* 96 more tubewells have been installed in the Shahkot block of Jullundur district at a cost of Rs 46 lakh to irrigate 71,000 acres of arid land.

YOJANA

The journal of the Planning Commission published fortnightly in English, Hindi, Assamese, Bengali and Tamil

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