



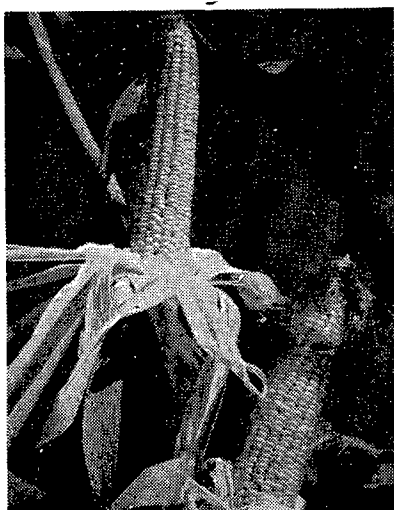
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80 PAISE

Environment
and
Pollution



The latest hybrid Maize JML-603 developed by PAU, Ludhiana

The Punjab Agricultural University has identified a new rice strain which is better than Jaya in productivity, grain quality and other agronomical characters. It has been evolved following the testing and development of a number of strains during the last 4 to 5 years at its research stations at Ludhiana, Kapurthala and Gurdaspur. It has been named PR-106 and is expected to prove superior to IR-8 and Jaya.

The plants of this newly developed strain are similar to those of Jaya except that they are taller (104 cm) and have broader leaves. The grains are long, slender and clear with very good cooking quality against the bold grains of Jaya which have poor cooking quality.

It gives on an average 5.3 per

Punjab Agricultural University Develops New Hybrids

cent more yield than Jaya and is comparatively more resistant to major diseases.

The University has also evolved a new early-maturing variety of maize called JML-603. It has been released by the Variety Approval Committee of the Punjab for cultivation in Punjab under the name of Ageti-76 (Early-76).

Prior to its final release this variety was tested for 3 years in all-India coordinated trials where it did extremely well. Its performance at farmers' fields in the Punjab last year was also very satisfying. At research stations it yielded 41 quintals per hectare i.e. 27 per cent more than locals and 7 per cent more than Makki Safed-1, a variety released in 1973. It has bold, medium, round and orange-yellow grains which



New Rice Variety IR-106 with better resistance to pests

are preferred over white ones for food. The height of the plant is lower than Vijay by 12 per cent which is a great advantage. The stem is medium thick, it matures in about 88 days against 95 to 100 days of hybrids or composites. It will, therefore, suit better in the popular maize-wheat rotation system prevalent in Punjab.

This variety is resistant to brown stripe downy mildew disease. It is also very tolerant to stem borer, the most important enemy of maize.

In the Punjab, maize covers an area of about 5.5 lakh hectares of which only a small fraction is under high yielding varieties and composites. Local varieties continue to occupy a predominant place because they ripe early and are also better adapted to medium and low fertility conditions.

Cultivation of Red Banana

THE COLOURFUL bunches of Red Banana steal the attention and appreciation of the thousands of spectators in all the National Banana Shows.

Most robust among the type, Red Banana produces scarlet coloured large fruits with thick skin. The pulp is saffron in colour, moderately firm, fairly moist, sweet with good flavour and melts in the mouth.

The Directorate of Extension, Ministry of Agriculture, can be proud of the fact that it has succeeded in popularising this variety. Earlier this variety was not known much in the fruit markets outside Kerala.

Grown mostly in the southern parts



of Kerala, Red Banana enjoys a premium in the local markets and tourists are the chief patrons of the fruit as they do not mind to pay even ninety paise for a bulky ripe one.

It would have eliminated all other varieties in the state but for the fact that its cultivation is a back-breaking job with many hidden risks. If properly tended, it will take a minimum of fourteen months for harvest. Even the slightest negligence will stretch the cultivation period to 18 months and sometimes even up to 24 months.

Studies on packaging for long distance transport should be undertaken as the future of this choice banana depends on finding more markets outside the state.

R. Hali

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Chief Editor

S. SRINIVASACHAR

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Editor : N. N. Chatterjee. **Assistant Editors:** N. G. Chaudhry, Swatantra Radhakrishnan. **Senior Correspondents :** AHMEDABAD—Raman Patel, BOMBAY—Avinash Godbole, CALCUTTA—P. B. Ray, GAUHATI—P. K. Chankakoti, HYDERABAD—V. K. Sastry MADRAS—Poornam Viswanathan, TRIVANDRUM—Rosscoe Krishna Pillai. **Correspondent :** Siddharthan Kariyal. **Photographic Officer :** P. K. Kapoor. **Sub-Editor :** Jasbir Batra. **Advertisement Manager :** D. Krishna Rao. **Editorial Office :** Yojana Bhavan, Parliament Street, New Delhi-110001. **Telegraphic Address :** Yojana New Delhi. **Telephones :** 383655, 387910, 385481. extensions 402 and 420. **Circulation :** Business Manager, Publications Division, Patiala House, New Delhi-110001. **Subscriptions :** Annual—Rs. 18, Two years—Rs. 30, Three years—Rs. 42. **Foreign Subscriptions :** One year—£1.80 or \$5.50. Two Years—£3.00 or \$9.00. Three years—£4.20 or \$12.50. Single copy—Eight pennies or \$0.25.

EDITORIAL

An Epochal Month

Progress and peace are facets of one indivisible concept. It has been the experience of many countries that international understanding has eluded their grasp because of an exaggerated emphasis on national interests resulting from the hangover of an unhappy past. After many years of sincere devotion to the cause of progress at home and peace abroad India is now in a position to say that a break-through has at last been achieved in her relations with her neighbours. In the short span of one month that has just preceded, India has been able to establish close bilateral relations with a number of countries whose friendship she has always valued—China, Nepal, Iran and Pakistan. India has always held fast to the belief that every country should be allowed full freedom to choose its own destiny in an atmosphere of peaceful co-existence. Happy external relations providing for a smooth two-way traffic of trade and technology are an important condition for the economic development of any country and more so for the developing countries of South Asia. It is a tribute to the foresight and statesmanship of Mrs Indira Gandhi that her efforts to improve friendly relations with neighbours should have gone side by side with her Government's bid to wipe out the cancer of inflation and infuse a sense of justice in the social and economic life of the country.

India's initiative to exchange envoys with China at the ambassador level was quickly followed by agreements with Iran and Pakistan, two of our immediate neighbours with whom we have more than geographical links. The co-operation between India and Iran which began with the multi-million dollar Kudremukh project now promises to blossom into other fields of trade and technological co-operation. India's voice has always been on the side of peace, disarmament and economic co-operation between nations. The bilateral understanding agreed to between India and Iran has opened new possibilities of co-operation in the manufacture of aluminium, cement, sugar and other consumer goods with more to follow.

In less than a week thereafter India and Pakistan were able to reach accord at Islamabad on a number of issues—political and economic, signifying a major departure from an attitude of confrontation. The true significance of this accord lies in the fact that Mrs Gandhi could successfully persuade Pakistan to appreciate the need for a comprehensive accord on most of the major issues on which they were so long deadlocked. This has given new strength to the Simla agreement. The immediate advantage emanating from this accord at Islamabad is the resumption of goods and passenger traffic between the two countries which will benefit both. The psychological impact on normal trade and economic relations on the two Governments and the peoples is bound to erode the suspicion and tension that has characterised the relations of the two countries since independence and pave the way for a long lasting relationship as friendly neighbours.

These welcome developments in bilateral relations with neighbours must be viewed against the backdrop of equally important developments at home in Nagaland and Mizoram where the hostile, anti-national elements have come to realise the futility of confrontation. These are the achievements of the farseeing statesmanship of the Prime Minister and one can only hope that this spirit of pragmatism will be kept alive by everyone concerned to the total advantage of the entire region of South Asia.

By securing peace within and co-operation with our immediate neighbours the nation's resources can be more effectively harnessed to the tasks of development. About this there can be little doubt. The year 1975-76 will on this account alone be treated as a major landmark in the history of our young Republic.

Environmental Pollution:

What it Means to the Quality of Life

ENVIRONMENTAL POLLUTION can be defined as any adverse change in the environment caused directly or indirectly, by man, in the process of his living. With the increasing accent on indus-

trialisation, man became both the cause & victim of pollution. Industrialisation involves progressively greater exploitation of natural resources, with the consequent loading of the environment with harmful

by-products. With the result, pollution has assumed and will continue to assume giant proportions.

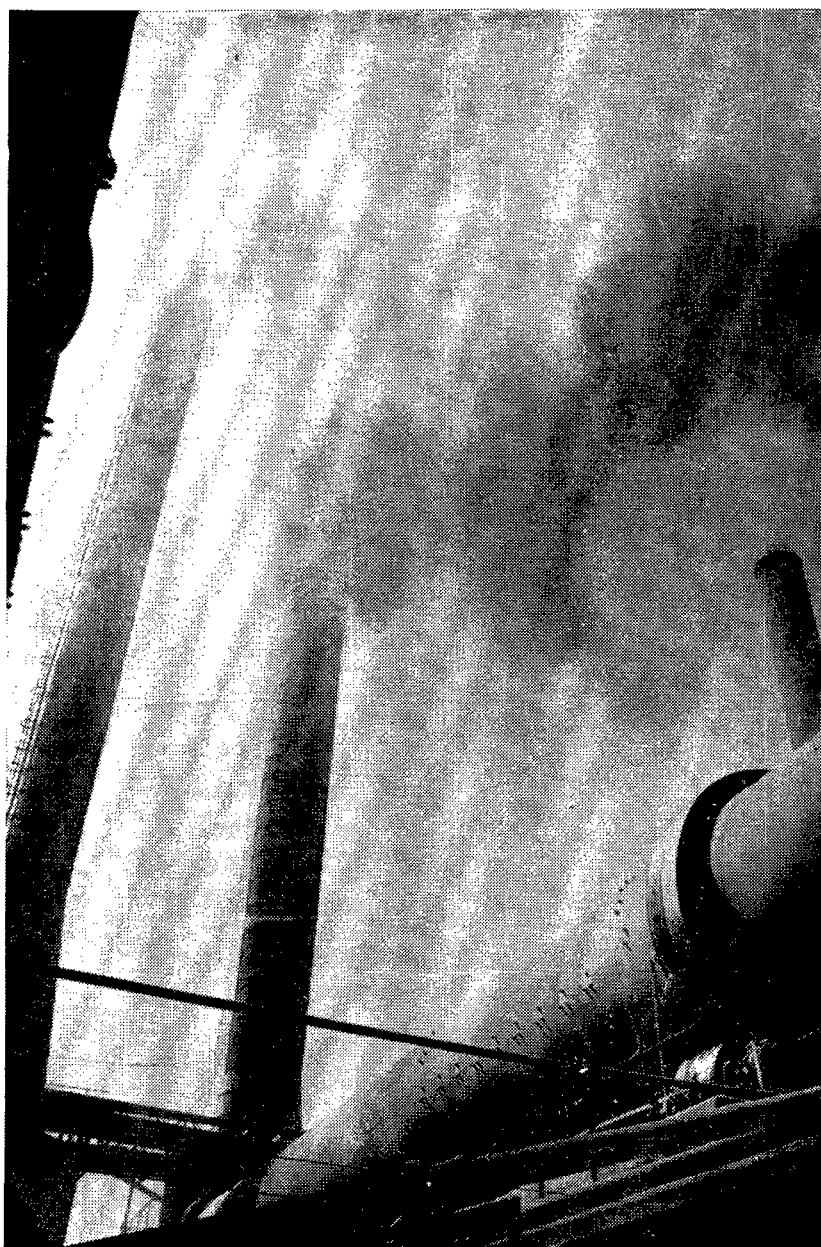
Air Pollution

There are many pollutants and many sides to the pollution problem. Air is obviously the first and most susceptible component of our environment to pollution. It being our fundamental need to keep ourselves alive, any change in its composition will create serious problems. According to the U.S. Engineers' Joint Council, "Air-Pollution means the presence in the outdoor atmosphere of one or more contaminants, such as dust, fumes, gas, mist, odour, smoke or vapour, in quantities, or characteristics and of duration, such as to be injurious to human, plant or animal life or to property, or which unreasonably interfere with the comfortable enjoyment of life and property." An added disadvantage is, air being all pervading, its pollution has the widest possible circulation and longer effects on all living things which cannot escape exposure to it.

Some of the main causes of air-pollution are domestic fuels like coal and firewood, combustion engines such as automobiles, planes, etc and industries. These cause an accumulation of solid particles, poisonous liquid particles and gases in clean air. Such an event causes serious and chronic respiratory disorders, heart diseases, cancer of the lung, etc., in man, besides stunting the growth of plants around the area. Commonly referred to as smog, this is nothing but a mixture of smoke and fog. The unburnt carbon particles get scattered in the air, absorb sunlight and reduce visibility, causing smog.

Most of our vehicles of transport today function with combustion engines, using petrol or diesel as fuel. These fuels are hydrocarbons. While functioning, these engines burn the fuels in the presence of a limited supply of air, resulting in the release of carbon monoxide, unburned hydrocarbon, and oxides of nitrogen.

These pollutants harm life in different ways. Increase in the carbon monoxide content in the air is obviously poisonous because the haemoglobin in our blood has a much greater affinity for it than for oxygen. Therefore, when more carbon monoxide is present in the air, more of it is taken up by the haemoglobin, thereby reducing the oxygen available to the cells in the body. The unburnt hydrocarbons cause smog and are now suspected to be carcinogenic.



Major pollutants are contributed by industries which exude sulphur dioxide, fly-ash, mineral dusts or poisonous gases.

The ordinary petrol we use contains lead which is emitted through the exhaust as poisonous lead oxide. 91 octane is free from lead, but than all vehicles are not desgined to run in 91 Octane, apart from its being more costly. Oxides of nitrogen absorb solar energy and trigger off many photochemical reactions damaging vision and lungs in man, reducing the blood's capacity to transport oxygen and affecting vegetation.

Industrial Air Pollution

Some of the major pollutants contributed by industrialisation are sulphur dioxide, suspend particles like fly-ash, mineral dusts from cement, glass and asbestos plants, poisonous gases from chemical industries, radio active fall-outs etc. Prolonged inhalation of sulphur dioxide is known to damage respiratory system causing asthma, tuberculosis etc., and corrode stone and steel.

These oxides are readily absorbed by plants and cause damage to them. In the Chembur area of Bombay, the air was found to have the second highest level of sulphur dioxide in the city. The air here becomes acidic during rains. People in the vicinity are afflicted with chronic lung ailments and defoliation of vegetation is conspicuous.

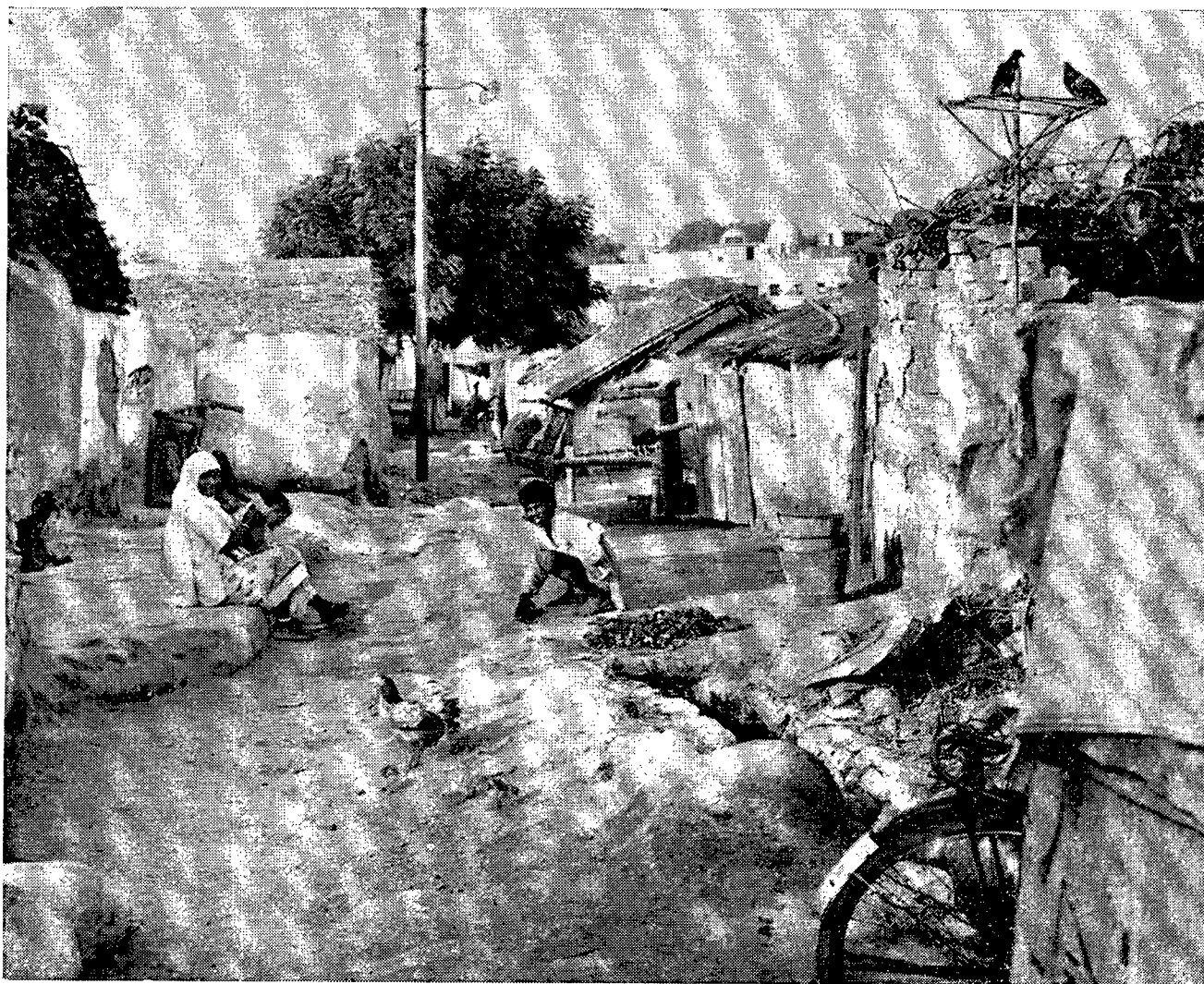
In rural areas, especially in an agricultural country like ours, insecticides and pesticides are a definite health hazard. With increasing population, the accent is on more food, which involves adequate crop protection. Pesticides, therefore, play a major role in controlling a wide variety of agricultural pests. The bulk of their usage is for spraying and dusting crops, with a small percentage being used for seed and soil treatments, grain storage etc. Modern techniques of air-spraying/dusting of pesticides disperse the particles over large areas

with standing crops. Diffusion of these over a much larger area than the target is inevitable, resulting in a build up of biotoxic chemicals in the atmosphere. In addition, indiscriminate usage of pesticides may result in the evolution of new resistant breeds of pests, defeating the very purpose of their use.

Water Pollution

Natural waters like rivers, lakes and seas are composed of not only water but also a whole lot of living organisms existing in a dynamic equilibrium. Any water is classified as polluted if it is not fit for human or animal consumption, industrial or agricultural use, navigation and recreation purposes. Pollution of water is caused by disposing sewage water and industrial effluents into it. In the rural areas in our country, the rivers and lakes are commonly used for bathing, washing clothes and cattle. The same water is sub-

In rural areas pollution comes largely from absence of environmental sanitation with open drains and cess pools which breed mosquitos and flies



sequently used for drinking and cooking as well. Improperly treated sewage contaminating potable water, causes bacterial epidemics.

In India, long-acting pesticides like DDT are directly added to water surfaces to eradicate malarial and filarial mosquitos. These obviously find their way to other water sources, because Indians are reported to have the highest concentration of DDT in their bodies. A concentrated air-dressing of pesticides too, may find their way to surface soil, then get leached out to rivers and streams and reach people directly or via animal, birds, fish and plants.

Thermal or heat pollution of natural waters is common in the vicinity of power plants generating electricity. The water used for cooling the working steam, is led back to the source at an appreciably higher temperature, affecting the aquatic organisms. Using nuclear power for industries opens up the possibility of radio-active wastes leaching out, which might cause enormous damage to the biosphere around.

Land Pollution

Garbage and solid wastes are unavoidable in any society. Heaps of foul smelling garbage harbour flies, mosquitoes and stray animals. In some towns, garbage is used for reclaiming stagnant ponds, marshes

In villages a common source of water supply is polluted when organic materials like jute fibre are soaked and cleaned, domestic animals are washed and human and animal excreta are allowed to be washed into it during the rainy season



and similar patches of land. But this can also create unhygienic surroundings if not covered adequately by surface layers of soil. Such open dumpings cause severe air and ground pollution, in addition to making that area of land useless for any purpose till the wastes decompose.

Conservation of land is effected to a large extent by forests. Trees conserve irrigation water, prevent soil erosion and silting of reservoirs in river valley projects. This is not all. Trees are important components of a country's natural wealth, contributing to a great many products of economic importance, starting from fire wood, right upto paper and industrial raw materials, harbouring a rich variety of wild life and affording recreational facilities. Indiscriminate deforestation not only lays the soil bare for ready erosion but also contributes to the extinction of wild-life resources of a country.

Noise Pollution

Recent addition to the galaxy of pollutants, is Noise. Noise is neither tangible nor measurable except highly scientifically. The amount of harm it does to a person depends on his sensitivity to it. Scientifically speaking, the intensity of the pitch and the frequency of the sound determine the quality of the noise.

Noise can disturb our sleep, affect our hearing, interfere with our conversation. This may result in lower efficiency in offices, increase in cough, hoarseness, throat pain and headaches, due to the strain of talking loudly in a noisy atmosphere. The maximum comfortable level for the human ear is assessed to be about 55 decibels. Continued exposure to levels above 100 decibels is proved to affect hearing ability and may damage the inner ear. Unless, steps are taken to reduce noise from individual vehicles, it is impossible to reduce traffic noise as a whole. Concentrated road traffic, careless maintenance of vehicles and excessive honking greatly add to noise pollution.

The problem of noise pollution is particularly acute near airports. The jet planes produce intrinsically more noise than the propeller planes. Besides, we now have the problem of 'sonic boom' caused by supersonic air-crafts. When a body travels at a speed in excess of the speed of sound, a 'sonic boom' is produced. It can be heard upto about 80 km. from the place of its origin. Thus, a supersonic plane flying at a great height can cause an unpleasant experience at ground level. These planes also destroy the thin ozone layer in the higher atmosphere with consequent increase in harmful rays from the sun.

Adulterated Food

A variety of food colours are added to food products like sweets, jams, sauces, soft drinks etc., to make them psychologically more appealing to the consumers. When these additives are not of permitted health standards, they prove to be a great threat to public health. Many of these contain arsenic which is very poisonous.

Increase in population leads to greater demands on our natural resources and less space for all. As people are forced to live in increasing proximity, pollution too closes in on them. More job needs arise, more commuters emerge and more traffic is inevitable. All these effects are commulative.

A practical and effective method of controlling pollution is by laws, implemented suitably.

If we want the earth to be as healthy and habitable as it used to be in the past, we have to plan differently for the future.

"The environmental problems of developing countries are not the side effects of excessive industrialisation but reflect the inadequacy of development." □

ACHIEVEMENTS OF NEERI

R. K. SARAF

WASTE MATERIALS like domestic sewage, industrial wastes, city refuse, etc., tend to spoil the environment since they contain one or more of the following constituents: i) Organic matter that can putrefy, ii) Pathogenic micro-organisms which are hazardous to health, and iii) Toxic compounds. Nature has bestowed upon the environment an immense assimilation and self-purification capacity. As long as the discharges of waste materials do not exceed this capacity, the environment can rejuvenate itself.

The best strategy in efficient management of the environment lies in the adequate treatment of waste materials and controlled discharge to the environment so that it can purify itself. This is precisely the direction in which the research and development activities are oriented in the field of environmental engineering.

In the year 1955, an epidemic of infectious hepatitis broke out in Delhi. Investigations led to the revelation that the water of the Jamuna had been grossly polluted by sewage

discharge into it. The unfortunate episode came as an eye opener and the concept of establishing a national capability to develop an indigenous know-how to prevent recurrence of such incidents gained momentum.

While work in this field was being done in several institutions in the country, it was considered desirable to establish an organisation to undertake research and developmental activities in this field exclusively. This took the name National Environmental Engineering Research Institute (formerly Central Public Health Engineering Research Institute) which was brought into being in 1959 at Nagpur. The focal function of the Institute is to undertake R & D activities to develop competent indigenous know-how in the field of environmental engineering with special emphasis on water treatment and supply, waste-water treatment and disposal, monitoring and control of water and air pollution, solid wastes management, rural sanitation and instrumentation.

While sophisticated methods have been developed for treating urban waste, sanitation facilities suitable

to rural areas are being introduced through research-cum-demonstration projects in some of the villages around Nagpur as a joint venture with the Zilla Parishad, Nagpur.

Water

In order to upgrade its quality, water should undergo one or more of the following unit treatment processes: coagulation, sedimentation, filtration and disinfection. Each of these unit processes has been probed. For on the spot disinfection of individual waters, disinfection tablets and chlorine ampoules have been developed. These have been found very useful particularly during emergencies such as floods.

Well water disinfection is of special relevance in this country since it is a major source of water supply. In an attempt to provide a simple mechanism for continuous chlorination of well water, a "Chlorine Cartridge" made of earthen-ware pot has been developed. It works effectively for 10-15 days in medium-sized wells.

Excessive fluorides in water (permissible level 1 mg/l) has been observed in several areas like Andhra Pradesh, Rajasthan, Maharashtra, Tamil Nadu, Madhya Pradesh, etc. Fluorosis is also prevalent in these areas. To remove these excessive fluorides, NEERI has developed what is known as the "Nalgonda Technique". It comprises addition of

A Common sight near towns and cities : Carrion and other organic wastes dumped in the open.



lime, bleaching powder and alum to fluoride bearing water in sequence and allowing a certain period for flocculation and sedimentation. The process gives a filtrate devoid of the excessive fluorides.

Yet another achievement of the Institute is the discovery that high grade bituminous coal can substitute imported anthracite medium in double layer water filtration.

In the complex network of water distribution system, upto 40 per cent of the water distributed gets lost. In the absence of adequate pressures, the contaminated water outside can infiltrate into the pipeline. If the wastage through leaks alone is avoided, the urgency of tapping additional water resources for augmentation can be deferred to some extent.

Waste Water

Waste water is a common term for used-up water, domestic sewage and industrial effluents. Waste waters usually terminate into a water body and sometimes on to land. Usually, physical and chemical processes are also utilised judiciously to get rid of the pollutants in waste water. Towards waste water treatment, NEERI has assessed suitability of three low cost waste treatment methods, viz., stabilisation pond, aerated lagoon and oxidation ditch. Compared to the conventional treatment methods like trickling filter and activated sludge process requiring sophisticated mechanical equipment and skilled personnel for operation and maintenance, these low methods require none of them (except perhaps a motor for driving waste-water into the system and a rotor for mechanical aeration) and yet there is no compromise on the efficacy of treatment.

These methods, either singly or in combination, are found to be adequate in most of the cases of industrial effluents as well. This has been assessed by the Institute while examining the amenability of several industrial wastes to chemical and biological treatment. The following are some of the examples: synthetic drugs, photofilm, pulp and paper, rayon pulp, strawboard, pharmaceutical, chemical, antibiotic, high explosives, fertilizer, textile, petrochemicals, starch, steel mill, electro-plating, distillery, coffee, slaughter house, tanneries, sago and dairy. A number of these plants are functioning well in the country.

The treated effluents are found to support the growth of fishes. Besides fish culture being an economical proposition, this shows that water

courses can also receive the treated effluents.

NEERI studies on differentially diluted sewage with and without supplementation by NPK have shown that sewage, when diluted with water in ratios of 1:0.5 and 1:1 and fortified with fertilisers gives a balanced growth of crops and maximum crop yield. It also brings about efficient utilisation of sewage nutrients.

In view of the popular fear expressed in using raw sewage for irrigation of vegetables that are eaten raw, NEERI has found it economical to cultivate essential oil bearing plants like citronella and mentha which are extensively used for medicines and cosmetics.

Detection and Enumeration of Viruses

Treated wastewater effluents, in spite of meeting standards set in terms of physico-chemical, biological and bacteriological parameters, can yet contain considerable viral load and hence deserve to be thoroughly disinfected before discharge.

NEERI has developed a modified membrane filter method for detection and enumeration of viruses from wastewater. Further, a new method for concentrating viruses from large volumes of water has also been developed wherein the water is filtered through a bed of magnetic iron oxide. The viruses retained on the bed are eluted for quantitation by plaque technique.

Air Pollution

Although of a relatively recent origin, the problem of air pollution has merited attention in many places in the country. NEERI has set up a national network in nine select cities to monitor common air pollutants such as suspended particulates, carbon monoxide, and oxides of sulphur and nitrogen. It is hoped that the long-term data on these air pollution parameters will eventually help setting up of Indian Standards.

Solid Wastes Management

Dumping of city refuse is a common sight even in big cities. NEERI has assessed characteristics of city refuse from as many as 33 important typical cities. This investigation is an important prelude to assess amenability of city refuse to composting and incineration. On request, NEERI undertakes feasibility studies to suggest alternatives for collection, transportation and dis-

posal of solid wastes. The process of composting has two-fold importance, in reducing the health hazards on the one hand and providing well stabilised compost manure on the other. In the agrarian economy of India, this is a very important consideration.

Biogas

Nightsoil, cattle dung as well as city refuse can be anaerobically digested to yield biogas with a rich fuel value. In the wake of energy crisis, this R & D effort has assumed special significance. A nightsoil digester is being operated in the premises of the Central Jail, Nagpur, using the nightsoil from the jail inmates. The biogas generated is actually being used for its calorific value. Preliminary trials on deriving biogas from city refuse have been encouraging. These studies are being intensified.

Instrumentation

Instrumentation is an integral part of the development of indigenous technology. A regular programme has been initiated to develop indigenous equipments wherever feasible. The following are a few examples: Wind speed and Direction Recorders for collecting micro-meteorological data useful for air pollution survey work; NEERI Chloroscope for estimation of residual chlorine in water; High Volume Air Sampler and Multigas Sampling Kit for simultaneous sampling of several gaseous pollutants. Sophisticated instruments such as ultra-violet, visible infra-red, atomic absorption spectro-photometer and gas chromatograph, are also available and these facilities are provided to various organisations in the field.

As a consequence of the legislation on water pollution, several States have recently set up Water Pollution Control Boards like the one at the Centre. The Air Pollution Control Bill is also on the anvil. The day is not far when an attempt to foul the environment, knowingly or inadvertently, will be punished as an offence. There are no two opinions that legislation is necessary for the protection of the environment. What should, however, be aimed at is the minimal resort to legislation which is possible only when the industries, corporations and other civic agencies conceive of environmental pollution control measures at the inception itself and implement them in the right spirit. □

Standards To Contain ENVIRONMENTAL POLLUTION

JYOTI K. PARIKH

THE problems of setting environmental standards are many and complicated. The environmental conditions vary with regions, seasons, climatological factors etc. Many aspects of the problems are such that at times it is difficult to generalise on them. Moreover, different environmental conditions have different effects on human beings, plants and other forms of life and materials. The limits upto which each of them can tolerate certain types of pollutants will be different. Therefore, separate tolerance limits would have to be prescribed for water used for a variety of purposes, buildings constructed with different motives etc.

Even if one were able to control pollutants emitted from individual sources, pollution can still persist if the density of sources is too high. To take this matter into account, ambient standards have to be defined for air quality, various tolerance limits for water supply depending on its uses, ambient noise levels in the cities etc. These ambient standards have to be given with specifications so that they are not exceeded beyond certain specified limits

and more than a prescribed number of times during the year.

Having defined levels of emissions, tolerance limits, ambient standards etc., there is still the question of how to measure them. For this reason, methods of measurements have to be given so as to standardise the results of the various measurements taken at various places at various times. Thus, adequate attention has also to be given to the questions of standardization of methods of calibration, measurement and analysis.

Besides the technical problems which are indeed many, the different standards make an impact on a variety of aspects of a society's life. There is also the question of value judgement which is involved in determining environmental standards. If the standards are too low, then environmental degradation may take place affecting the present society as well as future generations. On the other hand, if they are too stringent, they may be too expensive or difficult to enforce, hampering economic development in underdeveloped countries.

ONE can imagine how complex the problem is from the fact that although we have more than 50 Indian standards listed, it has not been possible even to touch the fringe of the problem. In order to prescribe the ambient standards, for air quality, the hourly maximum limits and averages over 24 hours or one month have to be specified along with the methods for measuring them, taking into account the problems of standardization of calibration and methods of analysis.

At present in some metropolitan cities, a 'smoke nuisance-act' exists which covers only the pollutants emitted from the chimneys. An act to prevent air pollution is being contemplated at the Central and State levels in the very near future. The question of air pollution cries for immediate attention because the permissible levels for even the usual

pollutants such as particulates, SO_x , NO_x , hydrocarbons and carbon monoxide are not available. So far, only the methods of measurement for some pollutants such as particulates, H_2S , oxidants, hydrocarbons etc. have been specified. There are a number of ways of measuring these pollutants, but only those methods have been prescribed which are found to be suitable for measurement under Indian conditions in general and for which indigenous facilities are available or can be fabricated easily. The major hurdles in dealing with air pollution problems comprehensively is the availability of reliable equipment.

In view of the fact that ambient air quality standards for India are not available, the standards prescribed for the U.S. in 1971 by the environmental protection Agency are given below for information (Table 1).

Noise Pollution

The progress achieved in setting up

standards for noise pollution is somewhat better. Acceptable limits to noise are available. However, there are difficulties in enforcing these standards as there is no adequate legislation with a machinery to implement them.

Apart from this, there are standards applicable to sound meters, methods of measurements of noise emitted by machines, motor-vehicles and noise due to aircrafts. The acceptable noise levels prescribed for town planning by the Indian Standards Institution (ISI) for noise abatement are given below (Table 2).

Apart from this, the problem of assessment of noise-exposure during work for conversation purposes has been looked into. The present programme of work includes measurement of noise from machinery, optimum levels of industrial and residential noise and quality specifications for ear protectors.

Water & Industrial Effluents

We use water for a variety of

Jyoti Parikh belongs to the Environment Division Department of Science and Technology, New Delhi.

TABLE 1: AMBIENT AIR QUALITY STANDARDS IN THE U.S.

Pollutant	Averaging time	Primary standards	Secondary standards	Most relevant effect
Photochemical oxidants (Corrected for NO ₂)	1 hr.	160 ug/m ³ (0.8 ppm)	Same as primary std.	Eye irritation
Carbon monoxide	8 hr.	10 mg/m ³ 9 ppm 40 mg/m ³ (35 ppm)	Same as primary Std	2.5% COHb 2.5% COHb
Nitrogen dioxide	Annual Average 1 hr	100 ug/m ³ (0.05 ppm) 0.25 ppm	—do—	..
Sulfur dioxide	Annual Average 24 hrs	80 ug/m ³ (0.03 ppm) 365 ug/m ³ (0.14 ppm)	..	Respiratory irritation
	3 hr		13.0 ug/m ³ (0.5 ppm)	
	1 hr	0.5 ppm		
Suspended particulate matter	Annual geometric mean, 24 hr	75 ug/m ³ 260 ug/m ³	60 ug/m ³ 150 ug/m ³	Respiratory Disease
Hydrocarbons (corrected for Melhanus)	3 hr (6—9 A.M.)	160 ug/m ³ (0.24 ppm)	Same as primary Std.	Eye irritation

1. Standards, other than those based on annual average or annual geometric means, are not to be exceeded more than once a year, (Environmental Protection Agency, 1971)

purposes such as drinking, bathing, industrial uses, fish-culture, irrigation etc. Different tolerance limits are prescribed for inland surface water used for public water supply which may be utilised for different purposes and these are given in the Table below. (Table 3)

A Water Pollution (Prevention and Control) Act has been enacted in 1974 and various states have set up water pollution boards to control water pollution (essentially arising from industrial sources). Fortunately, most of the equipment and instruments required for measuring and monitoring are available and quite often indigenously made. Therefore, there is scope for dealing with the problems of water pollution of general nature with the available technology and expertise in the country.

Prior to the water pollution act, there have been other acts in some of the States existing under various names such as Effluents Control Act, Nuisance Act, Public health Act, Factories Act etc., which are used at times for controlling industrial effluents from large industries. Therefore, to enforce such a variety of acts effectively, tolerance limits have been prescribed by the ISI for the industrial effluents which can be discharged into inland surface waters, overland or in the public sewers by various industries.

However, there are special difficulties in complying with general standards of tolerance limits in the case of specific industries such as tanning, pulp and paper, sugar-cane etc., each one of which is being considered separately so that they are not confronted with impossible tasks of meeting environmental standards within reasonable costs. In addition, methods are prescribed for evaluating the toxicity of indus-

trial effluents discharged into waste water and surface waters. The guidelines for treatment of the effluents from tanning industry, paper and pulp industry and sugarcane industry have been given.

As regards drinking water, the Department of Health has described standards and a detailed manual is being prepared for water supply projects and their design considerations keeping population forecasts and water requirements in mind. In addition to the characteristics and the tolerance limits which are given in Table 3, there are further constraints if water is to be used for drinking purposes. Only the parameters which are especially different from those given in Table 3 in the case of drinking water are listed in Table 4.

The water being used for specific industrial purposes has to be of a certain quality as for example for storage batteries, textile and chemical industries etc. However, these standards concern specific manufacturing industries who have to sort out many technical problems.

Urban Planning Standards

In order to deal with the problems of human settlement, especially in the urban areas, it is essential to lay down various codes of practices, to draft and enforce legislation and to observe building bye-laws along with various construction codes.

At present, the layout of towns and cities are recommended by the State Planning Boards, Town and Country Planning Organization and metropolitan development autho-

TABLE 2: ACCEPTABLE NOISE LEVELS*

Acceptable outdoor noise levels in Residential areas			Acceptable Indoor noise levels for various types of buildings		
S. No.	Location	Noise level db (A)	S. No.	Location	Noise level db(A)
i)	Rural	25-33	i)	Radio & T.V. studio	25-30
ii)	Suburban	30-40	ii)	Music Room	30-35
iii)	Residential (urban)	35-40	iii)	Hospitals, class rooms, auditoria	35-40
iv)	Uurban (residential and business)	40-50	iv)	Apartments, hotels homes, conference rooms small offices	35-40
v)	City	45-55	v)	Court rooms, private offices, libraries	40-45
vi)	Industrial area	50-60	vi)	Large public offices, banks, stores, etc.	45-50
			vii)	Restaurants	50-55

*Recommendations for Noise abatement in town planning, Indian Standards Institution, Manak Bhavan, 9, Bahadur Shah Zafar Marg, New Delhi-110001.

Classification of Zones

- Quiet
- Zones of concentrated noise sources quite at times
- Zones of concentrated average noise sources
- Zones of high noise sources
- Zones of extremely high noise sources

Noise Level

- 60 dBs
- 60-70 dBs
- 70-80 dBs
- 80-90 dBs
- 90 dBs

rities. There are approximately 8 development authorities in the major Indian cities which deal with urban planning. The present planning process takes into consideration the many physical conditions such as population (gross and net density in a given locale), transportation, location of activities, availability of amenities such as water, electricity etc. Keeping these conditions in mind, land-use patterns, especially concerning green belts, shopping areas, industrial areas and traffic pattern are recommended by the State Planning Boards and Town and Country Planning Organisation and are generally implemented by the municipal corporations. The matters concerning zoning, floor, space index in various zones etc. are also planned by these organizations.

In addition, the question of sanitation, sewage discharge, water supply and drainage should receive due attention prior to the construction of the buildings. This matter, if neglected, can have serious repercussions on the water and soil quality which are essential aspects of urban environment. The codes of practice laid down by the ISI especially in the field of sewage disposal and water supply are in regard to design and construction of septic tanks, sanitary appliances, drainage, water supply and sewage system. There are building bye-laws which essentially deal with the light, ventilation and safety aspects of buildings.

However, the growth of rural and urban areas has gone on practically unchecked. Specially, if the cities are not very new, then various plan (or unplanned) patterns of various time periods in various zones are superimposed and the final result appears to be a kind of organic growth. While deciding on land use pattern, the question of maintaining ambient standards for air, water, soil, noise and temperature of cities are not looked into properly.

Very little has been done in laying out land use pattern in the rural areas. The various modes through which they receive sustenance from neighbouring areas have yet to receive proper attention.

There is much to be desired in perfecting the methodology of arriving at standards. A number of difficulties faced in this matter are summarised by G. Saxena and B. Krishnamachar. Some general comments on the subject may be made to get a clearer picture of the problem.

While reviewing the present environmental standards with regard to



IGNORAMAN

wants to know

whether closed minds

*contribute to
environmental pollution.*

air, water and noise pollution, we have identified various areas which require careful study. In addition to these, there are other areas which have yet to be covered adequately for better environmental management.

By and large, the standards prescribed so far cover industrial pollution and their effects on the urban environment. However, the question of pesticides and fertilizers application and their effects on the rural environment have not yet been adequately dealt with.

The degradation of soil quality due to the discharge of industrial effluents overland is an area which should also receive due consideration.

The problems of tackling solid waste disposal overland is difficult and has not yet been dealt with.

The issue of ocean pollution due to effluents from refineries, other industrial effluents and transport have yet to be tackled.

In the case of urban environment, urban indicators have to be identified which can give guidelines for town and city planning. This may relate to population density, industrial infrastructure, slums, prevention of pollution etc. advance planning of which can prevent a number of problems instead of having to solve them after they are created.

Setting environmental standards, drafting legislation and the implementation and enforcement of legislation, guidelines etc., are the

TABLE 3 TOLERANCE LIMITS FOR INLAND SURFACE WATERS FOR USE AS RAW WATER FOR PUBLIC WATER SUPPLY AND FOR BATHING GHATS

S.No.	Characteristic	Tolerance Limit
i)	Coliform organisms (monthly average MPN per 100 ml)	Not more than 5000, with less than 5 per cent of the samples with value 20000 and less than 20 per cent of the samples with value 5000
ii)	pH value	6.0 to 9.0
iii)	Fluorides mg/l, Max	1.5
iv)	Chlorides mg/l, Max	600
v)	Cyanides mg/l, Max	0.01
vi)	Selenium mg/l, Max	0.05
vii)	Lead mg/l, Max	0.1
viii)	Total chromium mg/l, Max	0.05
ix)	Arsenic mg/l, Max	0.2
x)	Dissolved oxygen, Min	40 per cent saturation value or 3 mg/l whichever is higher
xi)	Biochemical oxygen demand mg/l, Max	3
xii)	Phenolic compounds, mg/l, Max	0.005
xiii)	Alpha emitters, uc/ml, Max	10-9
xiv)	Beta emitters, uc/ml, Max	10-8
xv)	Nitrates mg/l, Max	50
xvi)	Oils and grease, mg/l, Max	0.1
xvii)	Insecticides	absent

Yojana QUIZ

1. Where are the following: Strait Island, Havelock Island, Neil Island, Campbell Bay and Interview Island?
2. Indian citizens need an international passport to fly to a certain part of India. Which is that part?
3. Where is the world's second largest saw mill situated?
4. Where is India's southernmost point on the map?
5. Where does it rain 200 days on an average in Indian territory?
6. There is a tribal people in India who have not been contacted at all by modern man. Where do they live?
7. India boasts of a crustacean which lives in no other part of the Northern Hemisphere. Where do we find it?
8. In a certain part of this country Hindus happily marry Muslims and some parents even bestow Christian, Muslim and Hindu names on their children. Where?
9. In a certain capital, a jail is a national shrine. Where is it?
10. Which is the remotest part of India?

ANSWERS: The answer to all the above questions is, Andaman and Nicobar Islands.

Yojana's Chief Editor, S. Srinivasachar, Correspondent, Siddharthan Kariyal, and Photographic Officer, P.K. Kapoor, have just returned after a three-week stay in this fascinating Union Territory. Look out for a Special Number of *Yojana* carrying their reports, pictures and articles by specialists.

THE NEXT STUDENTS' FORUM:

*Should we
have another
constitution?*

Last date:
30 June 1976

TABLE 4. STANDARDS FOR PHYSICAL AND CHEMICAL QUALITY OF WATER

	Permissive	Excessive
i) Physical		
Turbidity (units on Silica Scale)	5 units	25 units
Colour (units in Platinum Cobalt scale)	5 units	25 units
Taste and odour	Nothing	disagreeable
ii) Chemical		
pH	7.0 to 8.5	Less than 6.5 or greater than 9.2
Total solids	500 mg/l	1500 mg/l
Total hardness (as Ca CO ₃)	300 mg/l	600 mg/l
Calcium (as Ca)	75 mg/l	200 mg/l
Magnesium (as Mg)	50 mg/l	150 mg/l
Iron (as Fe)	0.3 mg/l	1.0 mg/l
Manganese (as Mn)	0.1 mg/l	0.5 mg/l
Copper (as Cu)	1.0 mg/l	3.0 mg/l
Zinc (as Zn)	5.0 mg/l	15.0 mg/l
Chlorides (as Cl)	250 mg/l	1000 mg/l
Sulphates (as SO ₄)	250 mg/l	400 mg/l
Phenolic substances (as Phenol)	0.001 mg/l	0.002 mg/l

Standards for Drinking Water, Ministry of Health and Family Planning (Department of Health), New Delhi.

three activities which should be co-ordinated so as to bring about the desired results. In particular, institutional machinery for the implementation of standards have to be set up and proper framework for them has to be created under which they can work most effectively. While developing various organisations for better environmental management, it should be kept in mind that the problems of air, water and soil pollution are interrelated and should be viewed in totality.

Developing and designing the instruments for the measurement, monitoring and control of pollution, which are indigenously made should be made available at low cost. For example, at present very few instruments are available for air pollution monitoring, sampling, testing, analysing etc.

The two main reasons why environmental problems are being neglected are lack of awareness and the costs involved in preventing pollution. Efforts are required from many agencies so as to bring about a social change, by combining persuasion and legislative action in respect of industries and a proper system of information dissemination to the general public.

There have been instances where pollution abatement measures, if planned in the initial stage, reduce costs of production. This is due to better management of resources which takes care of recycling and utilisation of residuals. In many cases the pollution problems arise because of inefficient use of energy and materials. Therefore, by proper planning it is possible to reduce the costs of pollution abatement. □

Man and His Deteriorating Environment

THE HEALTH and wellbeing of a population depend both on its degree of socioeconomic development and on the complex of physical, chemical, biological, and social factors that make up its environment.

It has become clear in recent years that environmental degradation, if allowed to proceed unchecked, could result in serious and even irreversible damage to life on this planet. Poor sanitary conditions and the accompanying communicable diseases are the most important causes of morbidity and mortality in the developing countries, where the majority of the world's population live.

These problems have been largely eliminated in the economically more advanced countries, where other environmental hazards have developed that affect health in a more insidious and complex way than do communicable diseases. These hazards, which are beginning to take their toll in developing countries too, include the physical and chemical factors and psychosocial influences which, together with microbiological agents, make up that part of the ecosystem most directly affecting man's health.

It is of crucial importance to define and specify the adverse effects of the environment. Unfortunately, a precise definition of many of these effects is not yet possible, owing partly to the complexity of the interactions between environmental factors and health and partly to lack of knowledge about many of the factors involved and about the part played by economic, political and cultural components.

Moreover, man is himself a highly complex organism and tends, when faced with fluctuations in the external environment, to maintain the balance of his internal environment within narrow limits. His homeostatic regulatory functions are closely integrated, and linked with the metabolic processes and the

defence and clearance mechanisms that enable him to cope to some extent with adverse changes in his surroundings. Thus, when faced with any challenge from the external environment, man's reaction is rarely direct and simple, and this is one of the main reasons why it is so difficult to obtain precise knowledge of the effects of the environment on health. Two extremely important characteristics are involved, namely adaptability and variability. Adaptability is a property of living things that enables them to attain a new state of equilibrium in a new situation; in man, it is dependent on the very wide variability of his biological, physiological, and mental characteristics. Such variability is encountered in the individual as well as within the different human groupings and makes it extremely difficult to elaborate universally applicable standards in the sphere of environment and health.

Finally, in man psycho-social and cultural factors play a preponderant role.

Environment and Health

Assessments of the adverse effects of environmental deterioration will differ according to whether one considers the individual or the population and according to the categories of population concerned. The task of defining health indicators finer than mortality, morbidity, or fertility has only just begun to be tackled. It is probably within the especially vulnerable groups (such as children, elderly persons, and the functionally or mentally handicapped) that sensitive indicators will have to be sought.

A dual methodological approach is needed consisting of the epidemiological method, whereby observable facts are studied in human populations under normal conditions of exposure, and the toxicological method, which involves studies and experiments on man and on animals (with all the uncertainties of extrapolation that this implies) and in

which the conditions of exposure are controlled. These two approaches are complementary, but when they lead to divergent conclusions the epidemiological findings must be given the greater weight.

General Environmental Factors

Certain general environmental factors—climatic, geographical, geological, and hydrological—can directly or indirectly influence the health and wellbeing of entire populations, sometimes independently of their socioeconomic circumstances but usually in interaction with them.

Man's remarkable adaptability has enabled him to populate almost the entire planet. The various climatic conditions have given rise to functional and behavioural adjustments, reflected in sociocultural differences that exert a major influence on the form and content of various mental illnesses. Thus a study of the sociocultural phenomena associated with certain psychiatric syndromes may further understanding of the role of sociocultural factors in man's adaptation to his environment. Morphological differentiation, often very marked, also occurs. For instance, the Eskimo has a high weight/body-surface ratio, in contrast to the nomad of the hot desert region. The relationships between these morphological differences and health are not, however, well understood.

By limiting physical activity, the dry desert heat or the damp heat of the equatorial regions may increase the incidence of cardiovascular disease and renal lithiasis. A "tropical asthenia" has also been postulated, but there have been no epidemiological studies to confirm the existence of such a syndrome. In general, mortality tends to decline with the normal seasonal increase in temperature; on the other hand, an abrupt rise in temperature is reflected in an increase in mortality. Elderly persons and heart patients—both vulnerable groups—are parti-

cularly sensitive to sudden temperature changes. Seasonal variations seem to play a major role in the onset and development of certain mental diseases (e.g. the affective psychoses) and psychosomatic disorders (e.g. gastric ulcer). Heat diminishes vigilance and may be responsible for some degree of apathy and thus for accidents. A certain increase in mortality and morbidity, particularly from respiratory tract and rheumatic conditions, has been observed in cold climates. Extreme climatic conditions also have a direct influence on the way of life and behaviour of social groups.

Individuals living at high altitudes show remarkable adaptation, with extensive physiological changes (e.g. pulmonary hypertension, reduction in the coronary and cerebral blood flow, and low arterial pressure). Arterial hypertension seems to be unknown and ischaemic heart disease is apparently very rare among indigenous populations at high altitudes. On the other hand, the number of congenital heart malformations seems to be high and pulmonary oedema is frequent. People from tropical regions have been unable to settle in the Andean plateaux because many of them carry the abnormal haemoglobin S (a factor that offers some protection against severe forms of malaria) and are therefore liable to suffer from serious blood disorders at high altitudes. Conversely, some populations living at very high altitudes, where there are few biological disease agents, seem unable to develop adequate immune responses when moved to a lowland environment where such agents abound.

Indirectly, climate can play a very important role in the ecological cycle, creating favourable conditions for the development of parasites or microbes and thus maintaining certain diseases in an endemic state or contributing to their epidemic spread. Reports from various sources have indicated an inverse statistical association between the hardness of drinking water and death rates from cardiovascular diseases. An excess of fluorides can cause bone lesions, and a lack of fluorides can be accompanied by a high incidence of dental caries. Iodine deficiency leads to endemic goitre. Almost all foodstuffs can be contaminated naturally by aflatoxins; the carcinogenic effects of which (liver cell epithelioma) have been reported in certain population groups.

In animals, overcrowding can influence both behaviour and physiological function. In man, there is a

clear correlation between a very high population density and the prevalence of mental disorders, although no definite casual relationship has yet been established. One of the most troublesome aspects of population concentrations is the tremendous pressure to consume goods, which is perhaps particularly strong in cities. When shopping is made easy and a wide variety of goods are attractively displayed, people buy far more than they need—and the inflated demand for consumer goods is, of course, highly disruptive to the environment in the long run. The place of consumer factors in environmental monitoring is obviously poorly understood and should be further investigated.

Research is also needed on other adverse psychosocial factors associated with high population density, ranging from alterations in child-rearing patterns to the lack of involvement in civic matters that may be engendered in urban concentrations above a certain level. Here we have nothing but sociological theory to guide us, for there has been little research on population density in relation to social and political issues. It is possible that such research would show the need for setting upper limits for population density as well as for potential pollutants.

Changes in socio-demographic structures, in particularly the transformation of family structure from the extended to the nuclear family, have a very important influence not only on patterns of physical and mental disease but also on the organisation of the health services. The disappearance of traditional forms of social behaviour reduces the ability of the community to look after its sick or disabled members. Socio-economic development and rapid population growth have produced a marked change in the age pyramid; in many parts of the world there has been an increase in the size of vulnerable groups (children and elderly persons) without a commensurate increase in the numbers of those engaged in the provision of medical care and social services and in education.

Features Peculiar to the more Industrialized Countries

In the economically and technically advanced countries, the biological effects of various forms of physical and chemical pollution of the environment and the psychosocial effects of the living and working conditions associated with industrialisation pose health problems whose importance and gravity are not easy

to determine precisely.

While the effects on health of the main deleterious agents in the environment are relatively well known in occupational exposure or acute accidental contamination (generally involving a very limited number and duration of exposures at high dosage), the individual or combined effect on large population groups of such agents at a low dosage over long periods is, with few exceptions, little understood or even completely unknown. The same applies to the consequences at the community level of the various forms of stress in modern life.

In the case of air pollution, the tragic episodes of the Meuse valley (1930), the Donora valley, Pennsylvania (1948), and London (1952) showed that, in extreme cases, air pollution can be a direct and major cause of morbidity and mortality. In the London episode excess mortality was associated with the presence of smoke and sulfur dioxide during a dense, cold fog lasting for days. This excess mortality, as also the rise in morbidity, occurred mainly in people suffering from bronchitis and, to a lesser degree, in those with coronary and myocardial disease.

Foodstuffs and drinking water, like the air, are subject to biological, chemical, and radioactive contamination, and this constitutes a source of potential danger to health. The same applies to soil pollution which, in the industrialised countries, arises mainly from the utilisation of a wide variety of chemical substances in agriculture, the dumping of large quantities of waste material from the mining of ores or from metal smelting; and the dumping of domestic refuse and solids resulting from the treatment of household and industrial wastes.

One of the most widespread annoyances in industrial civilisation is noise. Whether in the working environment, in road, city, or air traffic, or even in the home, the sources of noise are numerous, the sound level high, and the effects on health and wellbeing multifarious. Repeated occupational exposure to high levels of noise may lead to deafness. At a lower level, the loss of hearing acuity that occurs with age may be accelerated by exposure to noise. In addition, noise has certain non-specific physiological effects, not always the same, whose health significance has not been clearly determined—on the cardiovascular system, the respiratory tract, the eye, the galvanic skin responses,

and the blood and other body fluids.

At the psychophysiological level, noise mainly affects sleep, disturbance of which may in the long run be damaging to health (though epidemiological evidence on this point is lacking). In the psychosocial sphere, the annoyance and irritation due to noise are assuming ever greater importance at the individual and community level.

The Effects of Industrialisation

Occupational diseases and injuries result from specific exposure at work, but may aggravate cardiovascular, respiratory, neurological, or mental disease or be a factor in disease of multiple etiology.

All kinds of environmental pollutants—physical, chemical, and biological—can be encountered at the workplace, and concentrations generally far higher than in the normal environment. In addition, the workplace presents hazards of its own. For a large number of substances a level of exposure has been established above which there is a significant threat to the worker's health (called threshold limit value, maximum allowable concentration, or permissible dose). Developments in hygiene and safety at work have lessened the risk of occupational exposure in the major industries today, and it has been largely replaced by problems affecting health and well-being that are linked with psychosocial factors, working and living conditions, urban life, transport, and recreation, all interacting in complex ways.

A high degree of mechanisation may increase psychosomatic disorders, reduce job satisfaction, and contribute to a higher rate of absenteeism. Factors such as interpersonal relations at work, work stability, shift work, speed, and safety all play a part. Workers engaged in repetitive tasks controlled by machines derive less satisfaction from their work.

Night work, and the change of working hours from one shift to another, may subject the workers to stresses that increase the frequency of peptic ulcer and gastrointestinal disorder and produce symptoms such as fatigue, nervousness, irritability, and insomnia. These symptoms are usually related to lack of sleep, which in turn may be related to housing conditions and especially to disturbance of sleep by noise during the day.

It is often said that the increased tempo of modern life and the result-

ing stress are responsible for the rise in the frequency of mental disorders. This is probably true for psychosomatic diseases and psychoneuroses, though it has not been definitely proved. On the other hand, epidemiological studies have shown that the frequency of functional psychoses such as schizophrenia is not affected by the level or pace of socioeconomic development. The steady increase in the demand for medical, psychiatric, or social care is due to: (1) the changing social structure, the increase in the number of specialized jobs making it difficult to integrate the mentally handicapped or mentally ill; (2) the changing family structure, nuclear families generally finding it less easy to solve the problems posed by handicapped persons than do extended families; and (3) the expansion of mental health services (which also enables the frequency of mental disorders to be better known.)

To meet the need for unskilled manpower many countries utilize migratory labour. In Europe, 11 million workers are migrants from countries in Europe or Africa of lower economic level. Uprooted, transplanted, and inadequately integrated, such workers generally live in unsatisfactory conditions. The health services set up for them are often inadequate and do not permit rapid detection and treatment of illness. The social structures in the host country are rarely the same as those to which the migrants were accustomed at home, so that even minor problems may have disastrous mental health consequences.

Migrant workers are subject to three kinds of health problem. Apart from those they import with them, they acquire diseases in the host country, the most important of which is tuberculosis, estimated to be four or five times as frequent in migrants as in local workers. And they have problems of adjustment, owing mainly to language difficulties and cultural differences.

Chronic Diseases and Aging

Despite the hazards enumerated above, it must be recognised that industrial development and urbanisation have been attended by a spectacular increase in life expectancy; and the general state of health is better in urban than in rural areas. Nevertheless, in the more industrialised countries, the increased lifespan and the far-reaching changes in way of life and in environmental conditions are reflected in a higher incidence of noncommunicable chronic disease and in geriatric syn-

dromes. The range of mental and psychosomatic disorders in evidence is widening.

The Developing Countries

Whereas in the industrialised countries the factors having a direct or indirect effect on health are mainly those introduced by development, in the developing countries the leading role in this respect is played by factors in the natural environment. Among these factors, water is of particular importance. Much of the world's population lacks not only water supplies that are adequate in quality and quantity but also sufficiently hygienic means of wastes disposal.

The endemic diseases of the past still persist and are, in fact, sometimes spread by large irrigation schemes. It is estimated that schistosomiasis affects about 200 million individuals and that, in some areas, the prevalence exceeds 50 per cent. There are also tens of thousands of cases of ankylostomiasis, strongyloidiasis, and filarial diseases. As for malaria, despite considerable efforts over the years, hundreds of millions of people are still at high risk of the disease and, in one country where eradication had apparently been achieved, there have been some 2 million new cases since 1970.

Stockbreeding and agriculture are also affected by the unfavourable ecological conditions, and a vicious circle is started. Economic growth is hampered when large sectors of the population suffer from malnutrition and disease, while industrialisation introduces problems of urbanization and population density that are unfavourable to social development.

In the most industrialised as in the least favoured countries, environment and population are closely linked and interact—sometimes positively, sometimes negatively. The problems created can clearly be solved only through a global approach.

It is to be hoped that scientific progress will make it possible to reduce morbidity and prolong life. However, efforts to improve health must, in future, involve greater efforts to protect the essential biological ecosystems and prevent further degradation of the environment. Greater attention must also be paid to psychosocial factors, so that human life is not only prolonged and disease controlled but life is also happier and more harmonious. □

Courtesy WHO Chronicle

**In 1947
fertilisers in India
were just
a good idea
somebody had.**

**Today
we have
built 58
fertiliser
plants**

In 1947, India became a free country of 339 million people—so many mouths to feed. We understood that a revolution in farming was necessary. We needed chemical fertilisers, for these alone could spearhead an agricultural revolution and promise more food for our people.

In 1950 our total output of fertiliser was only 18,000 tonnes of nutrient. In 1951 we began the real task of raising this. Fertilisers were put down as a top priority item.

Today our fertiliser production has grown 84 times. We have increased the number of our fertiliser plants from 9 in 1951 to 58.

More are in the pipeline. And fertiliser consumption has increased. To more than ten times the quantity of nutrient per hectare from where we started.

The fertiliser industry is just one story of India's progress. There are many others in different fields. India today has built an industrial base which is shared only by a handful of nations. Grindlays are proud and happy to be associated with India's industrial progress.

Growth of Fertilisers at a glance						
	Unit	'60-61	'60-61	'70-71	'73-74	'74-75
Fertiliser production:						
Nitrogen	thousand tonnes of nutrient	9	88	830	1050	1187
Phosphatic	-do-	9	52	229	325	331
Fertiliser consumption:						
Nitrogen	-do-	47	210	1487	1835	2803 Est.
Phosphatic	-do-	14	70	452	634	913
Potassic	-do-	4	26	228	314	511
Foodgrain production:	million tonnes	50.8	82.3	108.4	103.6	104.0



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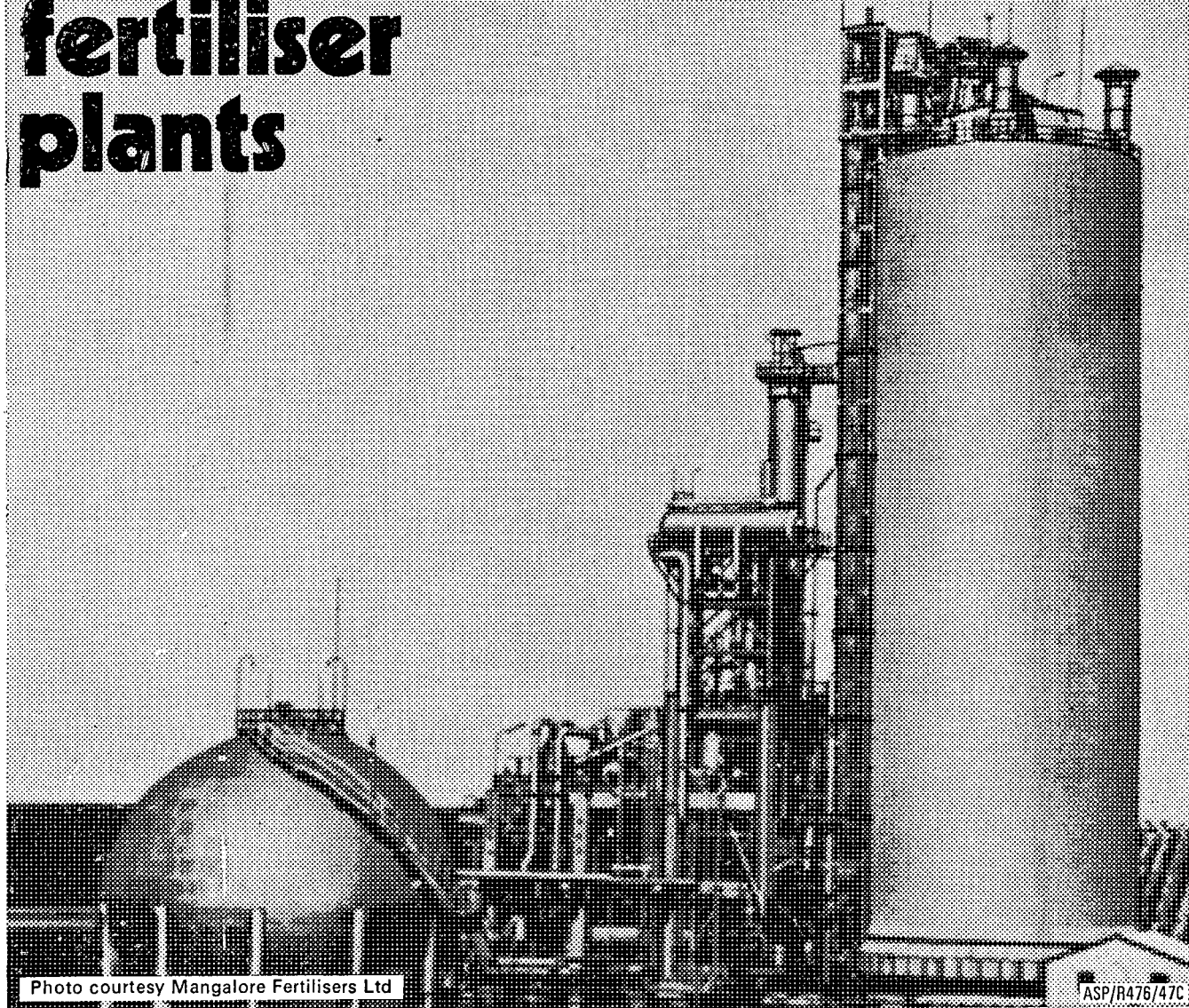


Photo courtesy Mangalore Fertilisers Ltd

ASP/R476/47C

CHOOSING A FUTURE

SCRATCH ANY PIECE of technology and you will find the values and aims of a society it was designed to serve. For technology is like genetic material—it carries with it the code of the society which conceived it.

That is why the choice of technology is such a crucial decision for the developing countries today. The kind of society and the kind of environment which they will create depends to a large extent on what technology they choose for the job of development.

There are several possible technologies for example, for increasing fertiliser production—a task which almost all developing countries are now setting themselves. How does the choice of technology for that job affect the kind of society and the kind of environment created?

One possible choice is the installation of large coal-based fertiliser factories. Another is the building

of small bio-gas plants at village level. The bio-gas plant breaks down human and animal wastes into a rich fertiliser and releases energy in the form of methane gas which can be used for cooking. The table below summarises the different impacts of the two methods.

The target for each method is the same—230,000 tonnes of nitrogen fertiliser per year.

Firstly, the choice of village level bio-gas technology base fertiliser production on renewable wastes as opposed to non-renewable resources.

Secondly, the bio-gas plant is non-polluting, whereas the coal-based fertiliser plant causes serious atmospheric pollution by emission of carbon dioxide.

On the economic front, the small-scale village bio-gas alternative saves \$15 million of precious capital and \$70 million of foreign exchange in countries which have acute capital shortages and balance of payments

crises. In addition the bio-gas plants yield a higher return on investment and deliver the urgently needed fertiliser more quickly—because the small plants can be brought to full production capacity in months whereas the large coal-based plant takes years to build and tune up to full production.

In terms of social development, the choice of bio-gas technology disperses production to 26,150 villages rather than concentrating output in one centre. So the benefits of development are spread more evenly. At the same time, it generates 130 times as much employment in countries where unemployment is one of the greatest perpetuators of poverty. And it provides that employment where it is most needed—in the poorer rural areas where the majority of the population still lives. In so doing, it also helps to arrest the disastrous drift to the slums and shanty-towns which surround many of the Third World's cities.

In terms of 'infrastructure', the choice of bio-gas produces the fertiliser where it is to be used, so avoiding the costs of packaging, marketing, advertising and transport and taking the strain of the already overloaded road and rail systems of the developing world. Not least, it frees the villager from dependence on the usually corrupt and inefficient systems for getting the fertiliser from the urban producer to the rural user.

In terms of the New Economic Order the choice of the small scale village level technology reduces the developing country's dependence on the developed world because the technology of bio-gas plants can be indigenously evolved whereas the technology of large coal-based fertiliser plants usually has to be imported from the West.

The list of advantages does not end here. Self-reliance and meeting of basic needs are the very foundations of development and genuine progress. And it is in this respect that the decentralised village scale bio-gas choice really comes into its own. It can mean increased self-reliance in two fundamental needs—

1 Western Technology	2 Appropriate Technology
One large coal-based fertiliser plant in the city 	26,150 small village-level bio-gas fertiliser plants 
TOTAL COST	TOTAL COST
 \$140 MILLION	 \$125 MILLION
FOREIGN EXCHANGE COST	FOREIGN EXCHANGE COST
approx \$70 MILLION  GOLD	NIL
JOBS CREATED	JOBS CREATED
1000 	130,750 
ENERGY CONSUMED	ENERGY GENERATED
approx 0.1 MILLION  MWH per year consumed	6.35 MILLION  MWH per year generated

fertiliser for growing more food and energy for cooking it.

The output from each village bio-gas plant can provide two and a half times the nitrogen fertiliser now used on the 290 cultivated acres of the average Indian villages. And this significant increase can be achieved by using the body waste from 500 human beings and 250 cattle. As 60% of India's villages have a population of under 500 and as the ratio of people to cattle is roughly 2:1 this means that most of India's villages can more than double their fertiliser use from their own renewable resources. That alone could be a great stride forward in self-reliance.

But finally there is the crucial question of energy needs. The city-based power station in the developing world rarely provides energy for the rural areas. The typical energy allocation of these centralised power stations is 80% to urban industry, 10% to urban homes and 10% to rural areas. In India, for example, only about 11% of the villages with a population under 500 have electricity.

This energy starvation in the rural areas had profound effects on many aspects of development. If, for example, a rural family has to spend four to six hours per day bringing drinking water from a well or a stream, and another four to six hours a day collecting firewood for cooking fuel, and another four to six hours per day grazing the cattle, then the only way the family can manage this is by having a large number of children. Indeed, millions of poor families depend today on the 'energy contribution' of children for survival. So anything which will increase the available energy in a village will speed up development and eventually slow down population growth by making it less necessary to have large families.

The choice of bio-gas technology for fertiliser production could provide that essential energy. A crude estimate of the energy needs in a village of 100 houses and 500 people is about 200 KWH per day for cooking; about the same for water pumping and small industry; and about 100 KWH for lighting. That is a total of roughly 500 KWH per day. The 5,000 cubic feet of bio-gas which is produced as a 'by-product' of making fertiliser out of animal and body wastes is the equal of about 660 KWH per day.

So this particular choice of technology has another crucial implication—the Western coal-based fertiliser technology implies *consuming* energy equivalent to the needs of about 500

villages, whereas the alternative bio-gas fertiliser technology helps in *producing* the energy to help meet the needs of 26,159 villages and of the poor in those villages.

The problem of distributing bio-gas cooking fuel to individual houses can be transformed into an advantage by using plastic pipes which convey clean drinking water at certain times of the day and bio-gas at the peak cooking hours. A protected water supply system of this kind, in conjunction with latrines that feed human wastes in to the anaerobic digester of the bio-gas fertiliser plant, may prove to be a breakthrough not only in meeting energy needs but also in providing low cost public health technology to eradicate the water-related diseases which are a major public health problem in almost all developing countries.

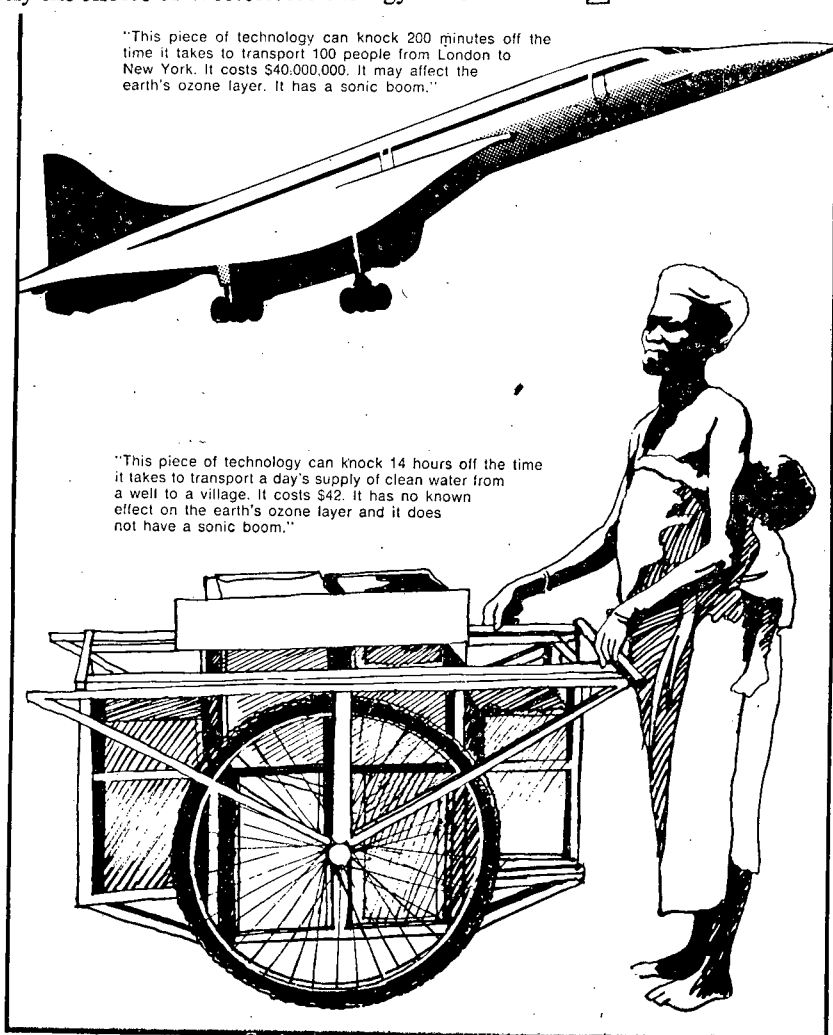
Lastly, the creation, operation, maintenance and management of the bio-gas fertiliser plant by village people can be a vital catalyst in stimulating and sustaining social participation and people's control which are the surest guarantees of real development.

The example of bio-gas fertiliser production shows in capsule form why the choice of Western technology

for most developing countries wastes scarce capital, concentrates benefits in urban areas, restricts rural employment opportunities, accelerates the drift to the urban slums, squanders foreign exchange, puts the village at the mercy of the towns, increases on the developed countries, undermines self-reliance and the meeting of basic needs, and defeats and distorts the developed process.

Whilst the prolific development of Western technology has led to spectacular increases in production, it has also shown an inbuilt tendency to damage the environment, reduce participation in the decision-making process, and magnify inequalities between and within countries.

By contrast, alternative technology such as the small-scale bio-gas plants is in harmony with the environment and with genuine development. It tends to reduce inequalities to meet real needs instead of artificial demands, and to increase self-reliance and participation by people in the decisions which affect their lives. Without a commitment to new and alternative technology, there cannot be a real advance towards meaningful development, towards a new economic order and, indeed, towards a new world. □



COMMERCIAL USES OF MUNICIPAL WASTES

P.K. BANDYOPADHYAY

WITH THE GROWING pressure of population on the world's material resources, the concepts of conservation and recycling of raw materials are gaining popularity. Recovering valuable by-products from industrial effluents is becoming almost an essential feature of all industrial processes. This is partly to meet the ever increasing cost of production, so as to be able to face growing competition in the national and international markets and partly to conserve resources as a national policy. In this atmosphere of cost reduction and waste avoidance, it is but natural that constant research is undertaken to finding newer and better methods of utilising profitably municipal wastes especially in industrially advanced countries. The oil crisis in recent years has added a new dimension to the problem of waste disposal *vis-a-vis* recovery of industrial energy from municipal waste.

Disposal of industrial and municipal wastes involves heavy transport cost, firstly because of the volume of such waste, and secondly, because of the ever-increasing problem of finding tipping grounds for the waste close enough to the cities where price of land is very high. Bombay and Calcutta are already experiencing the problem of tipping grounds because of high price of land in the suburban areas. Specialists in the technology of municipal waste disposal are, therefore, looking at these wastes as a potential source of energy, apart from many other uses to which these can be put.

In India more than 75 per cent of the urban wastes remain unutilised for any profitable purpose. The Committee on Urban Wastes appointed by the Government of India some years ago under the chairmanship of Shri B. Sivaraman, Member,

Planning Commission and Vice-Chairman of the National Commission on Agriculture, after studying the data collected from 230 local bodies, has in its recent report recommended compulsory composting of municipal waste to provide cheap and rich manure for agriculture. For this purpose it has advised the setting up of mechanical composting plants at 45 cities by the end of the Fifth Plan. Work for the setting up of such plants at Ahmedabad, Madras, Calcutta, Kanpur, Lucknow, Baroda and Bangalore is in progress. Other cities to have such plants soon are Delhi, Hyderabad, Poona, Nagpur, Gauhati, Jaipur, Ludhiana, Amritsar, Cuttack, Bhubaneswar and Patna. On the basis of the interim report submitted by the Sivaraman Committee earlier in 1973, a provision of Rs. 190 million has already been made in the Fifth Plan for this purpose.

With more and more industrialisation, per capita municipal waste is increasing rapidly both in terms of volume as well as in the variety of composition of such wastes. The composition of refuse in our country is roughly 59 per cent vegetable matter—(green or dehydrated), 18 per cent hay and straw, 6 per cent paper and rags, 14 per cent ash particles and the remaining 9 per cent leather, plastic, rubber, glass, metals etc. The heating property of such city refuse, according to thermal engineers, is about one-fourth that of coal or one-sixth that of oil. Apart from its heat generating value, more and more uses are being tried as industrial raw materials both before and after separation of the various ingredients. Starting from picking up plastic, rubber, paper, aluminium or iron particles from the dust-bins manually by hundreds of refuse collectors in all cities and dumping them at city outskirts for sale to prospective buyers (e.g. paper board manufacturers, packaging

industry, toy-makers, iron and aluminium scrap dealers, etc.) to the latest bacteriological method of conversion of refuse into protein, there are a variety of ways to use city garbage.

Controlled tipping, composting and incineration in association with shredding had for long years been the normal methods of municipal waste disposal. Composting after volume reduction has two advantages over tipping. First, it needs much less land, and secondly, it can meet to a certain extent the local fertilizer requirements. A Calcutta firm was reported to have been negotiating with a Middle Eastern country for a large scale export of compost fertilizer available in the suburbs of Calcutta. But the growing world concern for conservation and recycling of raw materials has made industrialists in many countries think in terms of popularising other methods of using municipal waste e.g. power generation in a central incinerator. The entire refuse production of Bombay if used in a central incinerator can feed a 60 to 70 MW thermal power plant. This method has been found to be very useful from the point of view of volume reduction of refuse and also in checking to a certain extent the spread of communicable diseases which normally appear in congested cities. But the associated problems are many, viz., environmental pollution, decomposition of the wet refuse, particularly during the rainy season, and also the inconsistent heating property of the refuse, depending on its composition. However, in view of the increasing fuel cost and the special advantages of incineration, more and more cities in the West are resorting to incineration with appropriate measures to control atmospheric pollution.

The latest trend in waste disposal, however, is to recover as much of the varied products as may be pos-

Mr. Bandyopadhyay is a Free-lance Writer.

sible from the waste and recycle them to their original use, like paper pulp, plastic, iron and aluminium, etc.

The process of separation, however, is not very easy and various methods are being adopted to effect prompt and economically viable separation. In the U.K., where incineration and composting account for over 80 per cent of the refuse disposal, paper, textiles and metals are recovered with the help of picking belts at very little extra cost. In India, most of the separation is done manually by hand-picking. In U.K., Japan and the USA a completely new technology is rapidly developing for a more scientific and improved method of handling refuse. Japan and the USA have with considerable success handled the high transport cost of refuse disposal by high density bailing systems at the low cost of Rs. 40 per tonne including transport charges up to a distance of 18.5 km one way. Pressure upto 4000 psi is employed for volume reduction which also obviates the need for any support binding. Shredding followed by air classification is applied to separate the light fuel from heavier material. Further separation of the ferrous metal is

possible with the help of magnetic belts. Recovery of individual components of refuse as clean products for reuse in their original form involves different stages of separation starting from feed preparation and then processes of primary and secondary separations involving shredding, screening, winnowing magnetic and ballistic separations. After sub-dividing the refuse into metallic heavy and light components, these can be further classified into saleable clean products with the help of processes like floatation, eddy current separation, thermal treatments, jigging, etc. Through a combination of some of these methods it is possible to get clean products like ferrous metals, plastics, fodder, paper pulp, wood and fibre at an approximate cost of Rs 30 per tonne. The pilot plant installed at College Park, Washington (USA) for separation of city refuse provides extensive practical demonstration of various techniques of separation that can be utilised on commercial scales. Through a combination of different methods it is possible to separate almost everything from everything else.

Apart from physical separation of the various components of waste

products, laboratory tests are in progress in the U.K. and the U.S.A. and other western countries to apply bacteriological methods for chemical conversion of waste products into proteins. Although the commercial success of various separation or conversion processes depends to a considerable extent on the local conditions and market, the increasing cost of paper, plastics, ferrous and non-ferrous metals and industrial and domestic fuel provides a promising future for this industry. Another revolutionary idea is taking shape fast regarding utilisation of municipal and industrial refuse on a large scale direct from the tipping ground to make solid building blocks of various sizes by subjecting this matter to very heavy pressure for making low cost houses to meet the worldwide housing shortage. At a recent conference of the U.N. Environmentalists the excellent prospects of using this cheap material on a global basis for house building has been emphasised. As the complicated and expensive processes of separation are not involved in such a use, the prospects of garbage utilisation for the construction industry seems quite bright. □

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ANNUAL PLAN for 1976-77

34.1 PER CENT STEP-UP IN DEVELOPMENT EXPENDITURE GREATER EMPHASIS ON RURAL DEVELOPMENT

The Annual Plan for 1976-77, presented to the Parliament by the Minister of State for Planning on May 26, would be of the order of Rs 78,520 million, an increase of 31.4 per cent over the previous year's outlay of Rs 59,780 million. This marks the highest step-up in development outlays in any one year since the beginning of planning in the country. The increases in development outlays in 1976-77 over the previous years are because of the more pronounced emphasis on agriculture, irrigation, power and industry and minerals which constitute the core sector of the economy.

The current year's plan has been formulated against the background of significant improvements in the overall economic situation and achievement of considerable price stability in 1975-76. The plan takes into account the new sense of discipline and dynamism infused into the economy and the new direction to the planning process given by the 20-point Economic Programme. Special care has been taken to ensure that the increase in investment over the original plan allocation does not lead to any inflationary pressure in the economy:

The investment pattern of the Annual Plan has been framed against this background, and special emphasis has been given to an effective and purposeful implementation of the 20-Point Economic Programme.

The year 1975-76 has been marked by a great degree of price stability, a substantial increase in agricultural

production, especially foodgrains, an accelerated industrial growth due to highly improved industrial relations, comfortable supply of essential commodities, and building up of a sizeable stock of foodgrains with the public agencies as a result of satisfactory procurement and some imports.

This significant improvement in the economic sphere was aided partly by favourable weather conditions but was mainly due to the concerted efforts and new initiatives undertaken by the Government to tackle the various economic problems facing the country, particularly after the declaration of emergency.

The most salient feature of the economic scene during the year just ended was the reversal of inflationary trends. The downward trend in prices that began since October 1974 was maintained during 1975-76. The wholesale index in the last week of March 1976 reached 282.9, a level which prevailed two years ago and was lower by 7.9 per cent than a year ago and by 14.4 per cent over September-end 1974. The average index for 1975-76 was lower by 3.3 per cent over that of the previous years. This negative rate of inflation is a significant achievement of the country.

The favourable price situation has been achieved partly through a substantial increase in agricultural and industrial production and partly as a result of vigorous measures to check economic offences of every kind. These and the dehoarding operations undertaken by the Government on an extensive scale led to a change in the psychology of both the consumer and the trader, resulting in the conversion of the sellers' market into a buyers' one.

Development of Agriculture

The hikes in development outlays in 1976-77 over the previous year are more pronounced in the field of agriculture and allied services, irrigation, power and industry and minerals in keeping with the general objective of strengthening the core sector of the economy. The provision for agriculture and allied services has been stepped up from Rs 6914.1 million in 1975-76 to Rs 8962.2 million, the increase being about 30 per cent. Besides, larger agricultural credit from financial institutions such as cooperative, commercial banks, Agricultural Refinance Corporation, etc., are likely to be available as compared to 1975-76.

The outlay for irrigation and flood control has been substantially increased from Rs 4682.2 million in 1975-76 to Rs 6867.9 million in 1976-77. The allocation for power has also

been stepped up from Rs 11015.8 million to Rs 14534 million, an increase of about 32 per cent.

The target of crop production during 1976-77 will be 116 million tonnes of foodgrain, 10.5 million tonnes of oilseeds, 150 million tonnes of sugarcane, 7.5 million bales of 170 kg. each of cotton and 6.5 million bales of 180 kg. each of jute and mesta.

The anticipated achievement of foodgrains during 1975-76 is 114 million tonnes of foodgrain, 10.5 million tonnes of oilseeds, 144.8 million tonnes of sugarcane, 6.9 million tonnes of cotton, 5.8 million tonnes of jute and mesta.

In view of the increase in planned investment for 1976-77 the production of foodgrains might turn out to

Accent on Agriculture through increased fertilisers and full utilisation of irrigation resources.

be even higher in the coming year if the weather remains as favourable as it was in 1975-76. The two main elements in the strategy for promoting agricultural growth and achievement of targets of production are the step-up in the consumption of fertilisers, increase in the area under irrigation, introduction of high-yielding varieties on a more extensive scale, and adoption of soil conservation methods. The irrigation facilities through major, medium and minor works will be extended to an additional 2 million hectares and the gross cropped area is also expected to increase by 2.3 million hectares. Besides intensive development programme for pulses that has been in operation in 40 districts since 1975, the intensive district programme for major commercial crops like oilseeds, cotton, jute and mesta, and sugarcane development in areas around sugarcane factories are proposed to be further intensified.

Special emphasis has been given to the improvement of the producti-

vity of small and marginal farmers particularly in the semi-arid zones. The provision for special programmes like Small and Marginal Farmers, Drought-prone Area and Command Area Development Programmes has been substantially raised from Rs 806.6 million in 1975-76 to Rs 938.3 million in 1976-77. A methodology of an integrated rural development programme will be worked out on an experimental basis and a provision of Rs 150 million has been made for this purpose in the Plan.

Step-up in Industry

The outlay for industry and minerals, which forms a substantial portion of the total investment in the public sector in 1976-77, has been increased from Rs 16440.2 million in 1975-76 to Rs 21853.4 million in 1976-77, an increase of about 33 per cent.

An industrial development Plan has been formulated to stimulate the rate of investment and growth in consonance with the main strategy outlined in the Draft Fifth Plan with adjustments in industrial priorities necessitated by developments at home and abroad during the last two years. The main plank of this strategy lies in the emphasis given to industries catering to agriculture, energy and exports, fuller utilisation of existing capacities and creation of new capacities and production of mass consumption goods, particularly those required for the weaker sections of the community. The provision for consumer goods industry such as textile, cement and paper in the public sector has been increased from Rs 640 million in 1975-76 to a little over Rs 850 million in 1976-77. The provision for providing investment and transport subsidy has also been doubled from Rs 50 million in 1975-76 to Rs 100 million for giving increased support to the programme of industrial development in the backward areas.

The outlook for industrial growth is very promising. The position in regard to availability of key inputs such as steel, coal, cement, power and transport facilities which has already shown considerable improvement is likely to improve further as a result of the achievement of physical targets envisaged in the Annual Plan. The installed capacity of power is likely to increase by 2.5 million KW in 1976-77. Railways are fully geared to handle the target of originating traffic of 225 million tonnes against 214 million tonnes in the previous year.

TABLE I
Sectoral distribution of the Annual Plan

Head of Development	(Rs. million)	
	1975-76	1976-77
1. Agriculture & Allied Programmes	6,914.1	8,962.3
2. Irrigation & Flood Control	4,682.2	6,867.9
3. Power	11,015.8	14,534.0
4. Village & Small Industries	738.9	950.2
5. Industry & Minerals	16,440.2	21,853.4
6. Transport & Communications	10,404.4	13,043.1
7. Social Services	7,828.2	10,100.6
8. Others	1,757.1	2,207.7
TOTAL	59,780.0	78,519.2

With the expected increase in agricultural production and agro-based industrial inputs, the new dynamism introduced in the working of public sector undertakings and the new climate of industrial peace generated in the economy, it is reasonable to expect that the rate of economic growth this year would be higher as compared to the previous year.

Other Services

Outlays on social services for 1976-77 have also been increased by about 29 per cent over the previous year. Special mention should be made about the allocation for hill and tribal areas which has been nearly doubled from Rs 400 million in 1975-76 to Rs 760 million in 1976-77.

The outlay for the Minimum Needs Programme has been considerably increased from Rs 1900 million in 1975-76 to about Rs 2550 million in 1976-77.

It is also significant that a substantial provision of Rs 23,376.8 million has been made under the 20-Point Economic Programme during 1976-77. The implementation of this programme is expected to create larger employment opportunities and income generation particularly for the weaker sections of the society.

The sectoral distribution of the Annual Plan outlay is given in Table I, previous page.

Employment, Manpower & Labour Welfare

Excepting the Pilot Intensive Rural Employment Project which completed its tenure of three years in October 1975 all other social programmes of rural development will be continued during the year. A Committee has been set up under the Chairmanship of Prof. M.L. Dantwala to study the socio-economic impact of the implementation of the Pilot Intensive Rural Employment Project with a view to evolving a comprehensive programme for the whole country. In regard to the Small Farmers' Development Agency, as against an outlay of Rs 210 million in 1975-76 the approved Plan outlay in Central sector for 1976-77 is Rs 260 million. Rs 239 million have been provided for the Tribal Development Agencies. A provision of Rs 340 million has been made for Drought-prone Area Programme against an outlay of Rs 250 million in 1975-76. The State Governments are also expected to make complimentary contribution from their own budgetary resources.

The Annual Plan 1976-77 for employment has been formulated,

keeping in view the need for providing expanded employment opportunities, a new scheme to train 30,000 carpet weavers in Jammu & Kashmir, Uttar Pradesh and other States is also being taken up for implementation. Besides, several schemes under the 20-point Economic Programme will substantially accelerate the generation of employment opportunities. These include the national apprenticeship scheme, special scheme for the development and strengthening of handloom industry. Some State Governments are launching new programmes, expanding the existing ones in the rural areas for the creation or improvement of durable assets such as wells, tanks, canals, as part of Plan scheme for rural development. These programmes are labour intensive and will also help in creating additional employment opportunities.

Special care is being taken to promote the welfare of backward classes and backward areas. Rs 954.2 million has been provided for the development of backward classes alone. This includes Rs 400 million for the tribal sub-Plans. All the eight Centrally-sponsored schemes included in the Fifth Plan will be continued. An amount of Rs 140 million has been provided for merit scholarship and 41.4 million of scheduled caste and scheduled tribe students are expected to benefit from it. An amount of Rs 394.8 million has been provided for State and Union

Territories in the Backward Class sector. Of these more than 40 per cent will be spent on educational schemes, about 30 per cent on economic aid, and the rest on health, housing, direction and administration. A special Central Assistance of Rs 400 million has been provided to States for tribal Sub-Plan areas. During the year the pace of formulation of integrated tribal development project will be accelerated. The States will take up programmes in priority areas as part of advance action. These programmes include debt redemption, restructuring the credit-cum-marketing organisation, updating the land records, minor irrigation, plantation schemes and agricultural development, and restructuring of administration.

20-Point Economic Programme

The various constituents of the 20-Point Economic Programme have received massive support in this Annual Plan. Attempt has been made to dovetail these programmes with the existing Plan schemes. The total outlays for such items as require financial support are:

In addition to the outlays provided in the Annual Plans of States and Union Territories, a provision of Rs 1637.1 million has been made in the Plan for various schemes relevant to this programme. The table below gives a view of the total availability of funds for this programme in 1976-77:-

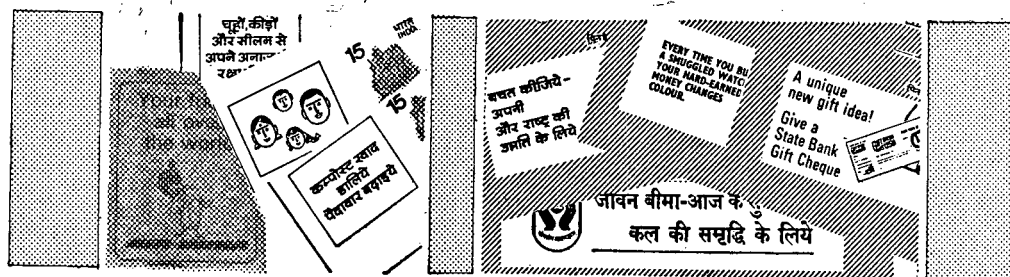
Outlays on 20-Point Economic Programme—States and Union Territories

	1975-76 Anticipated Expenditure	1976-77 Approved Outlays (Rs million)
1. Land Reforms	231.0	372.6
2. Minor Irrigation	1,291.8	1,490.4
3. Major & Medium Irrigation	4,750.5	6,136.3
4. Cooperation	432.1	575.2
5. Power	11,595.6	12,896.9
6. Handloom Industry	89.8	117.0
7. House-sites for Landless Labourers	98.3	99.7
8. Apprenticeship Schemes	3.8	9.5
9. Free supply of Books and Stationery and Book Banks	13.9	42.1
TOTAL	18,506.8	21,739.7

Allocation for 20-Point Economic Programme

	1975-76 Anticipated Expenditure	(Rs million) 1976-77 Approved Outlay
States & Union Territories	18,506.8	21,739.7
Central Sector	1,190.1	1,637.1
TOTAL	19,696.9	23,376.8

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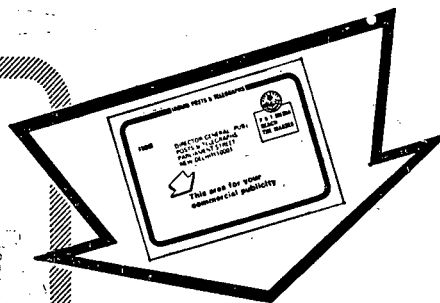


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SWADESHI AND SELF-RELIANCE

D.R. GOYAL

In her recent speeches the Prime Minister Mrs. Indira Gandhi has been stressing the importance of an all pervasive spirit of Swadeshi in which Indian produced goods, Indian Engineering projects, Indian designed machines, Indian invented techniques, Indian technicians and scientists will not only dominate the scene but enjoy high reputation and regard. As she said, it is not a narrow concept of mere self-sufficiency. We have all certain common tasks and imperatives. The foremost of them is to develop greater pride in Indian products and Indian skills. Inventiveness and the use of Indigenous materials and skills must be encouraged.

THE SWADESHI MOVEMENT has been an integral part of India's struggle for freedom. Gandhiji in one of his articles in "Young India" asserted that "Swaraj is almost wholly obtainable through Swadeshi."

Is it merely a matter of history however glorious it might be? Is it relevant today also? The answer leads us to think whether the struggle for India's Independence finally came to an end on the 15th of August 1947 when the British handed over administration to representatives of India or is it a continuing struggle? Never during the freedom struggle did we think of freedom merely as a change of masters. Leaders of the freedom movement time and again, insisted that freedom of India was not the replacement of white Sahibs with brown Sahibs. Like the freedom struggle freedom itself was conceived as a means to raise the level of Indian people as a whole, materially and spiritually. Looked at from that point of view, Swadeshi constitutes the very essence, the kernel of freedom.

Swadeshi means use of indigenous goods and products and pride in things Indian. The boycott of British goods was undertaken as a protest against the tyrannical foreign rule and Swadeshi was its positive side. It was meant to give the Indian people a sense of pride and self-confidence and to shake them out of indolent resignation to foreign domination.

Gandhi had said: "To use foreign articles and rejecting those that are manufactured in India is to be untrue to India. It is an unwarranted indulgence. To use foreign articles because we do not like indigenous ones is to be a foreigner. It is obvious that we cannot reject indigenous articles even as we cannot reject the native air and the native soil because they are inferior to foreign air and soil."

What Gandhiji said then is no less true today. We have not only to guard our freedom against dubious foreign manoeuvres to establish economic dominance but also to consolidate it by following a policy of self-reliance. That is why immediately after attaining political independence, our great leader and the maker of modern India, Jawaharlal Nehru, embarked upon a policy designed to vigorously industrialise the country and to provide to industry the solid and sound base of scientific and technical know-how. We can say with legitimate pride today that that policy has borne fruit and we stand on our own legs. That is the basis of our honoured standing in the comity of Nations. That is also why we are in a position to resist any pressures which tend to abridge our capacity for independent action in internal or external affairs.

It is significant to note that in 1950, India was obliged to import even simple things like pins and pencils. Today, we are exporting sophisticated electronic and engineering products to more than 90 countries in the world. In the years of Independence we have not only expanded our traditional industries like textiles, sugar, iron, cement and paper, but we have opened many new avenues and started manufacturing such items as power-driven pumps, diesel engines, electric motors, cables, electric fans, radio receivers, clocks and wrist watches. The high water mark of our achievements in this field is the Aryabhata with which we have launched into the space age.

India today is capable of meeting most of her domestic requirements of consumer and other goods. A number of these commodities are exported to other countries also. It should be a matter of pride for every Indian that sophisticated items like computers, watches, fans and typewriters have an ever-widening foreign

market. Indian goods are prominently displayed in the shop windows in many parts of the world. India is the third largest reservoir of technical intelligentsia and is in a position to help many other developing countries. We can also say with legitimate pride that 95 per cent of our defence requirements are met from indigenous production.

It is, however, a pity that a section of Indian people has not yet been able to overcome its inferiority complex and the craze for foreign goods is still there. It is a matter of shame that over 4,000 million rupees worth of foreign goods like wrist watches, textiles and electronic equipment are smuggled into the country every year.

This tendency to go in for foreign goods both insults and injures. It is an insult to India's national endeavour and it causes an injury to national economy. If things are manufactured within the country, it provides employment to millions and adds to national prosperity. If Indians buy only foreign goods, who will buy Indian goods? On the other hand, if we buy our own products, we shall be accelerating the process of industrialisation and also encouraging national talent for more creative endeavour. Who does not know the reputation of Swiss watches in the world and yet a Swiss firm is eager to take up selling agency for watches produced by the Hindustan Machine Tools.

The true spirit of Swadeshi means self-confidence, self-pride and self-reliance. It does not mean isolation. In the spirit of Swadeshi, we are prepared to co-operate and collaborate with other countries and we are doing so. What is needed is that Indians should develop a sense of patriotism and Swadeshi, because then only shall we be able to help ourselves and be of any use to the rest of the world. □

BEWARE! ✓

Pets can Spread Diseases

ZAKA IMAM



P.K. DE

PEOPLE ARE FOND of pet animals and spend considerable time and money in their maintenance. Pets are good companions and bring joy into the home. But the blessing is not unmixed; pets may also pass their diseases to human beings. Such diseases and infections which occur naturally in lower vertebrate animals and are transmissible to human beings, are termed zoonotic diseases.

There are over a hundred diseases or zoonoses transmissible from animals to man. Many such diseases affect us only occasionally while a

dozen zoonoses are significant public health hazards. Some zoonoses are on the increase in developed as well as in developing countries and the situation is continually changing. To name a few important ones, psittacosis or parrot fever is an acute virus disease transmitted by parrots, domestic and wild birds including pigeons. In man the symptoms are high fever, headache and pulmonary disorders. The disease is curable with antibiotics.

Salmonellosis or salmonella food poisoning is caused by bacterial organisms which produce acute gas-

troenteritis that can result in death. The source of infection is generally eggs, egg products, meat and meat products. The reservoirs of infection are domestic livestock, fowls and rodents which themselves, sometimes, succumb. Proper hygiene is required to check epidemics.

Leptospirosis, commonly known as Weil's disease or hemorrhagic jaundice, spreads through the excretions of rats, mice, dogs and cattle which contain the pathogenic organisms, spirochete or leptospire. It is of common occurrence where ever man, animals and water are

Haemorrhagic jaundice is common where men and animals are put up together.



Painting by AMRITA SHER GIL

YOJANA

found together. The vaccine against it gives some protection. Antibiotics also help in acute cases.

Tularemia, commonly known as rabbit fever is a bacterial disease which causes fever, prostration and ulcer at the site of infection and may be contracted when handling infected game such as hares and rabbit and also by eating insufficiently cooked game or drinking contaminated water. It can also be successfully treated with antibiotics.

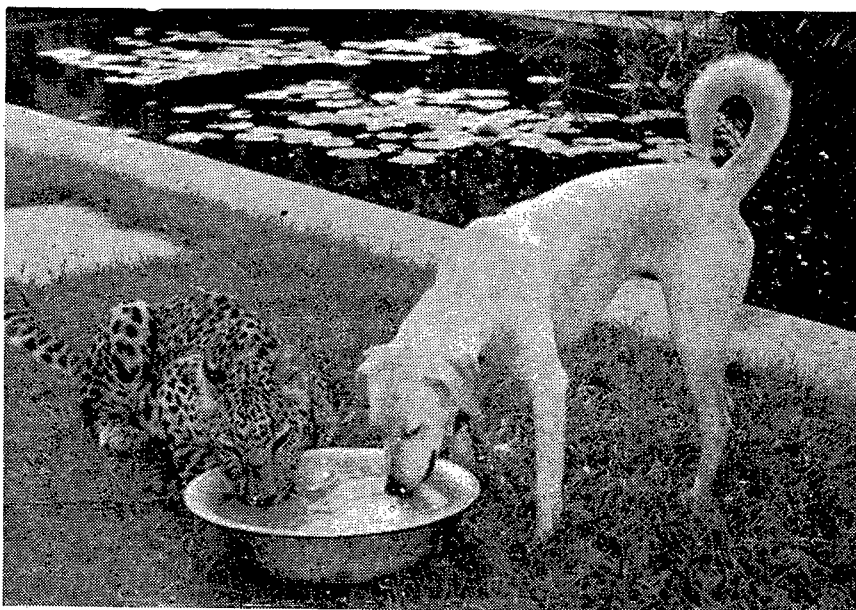
Larva migrans is caused by the larvae of the cat and dog roundworms which may invade various organs such as brain and eye. Tumour like growth in the eyes of adolescents as a result of such infection is common. The infection spreads by the sticky eggs (of the worms) passed along with the faeces of infected dogs and cats. These eggs adhere to toys of children. To avoid this disease puppies and kittens should be treated for worms and proper hygiene should be practised.

Rabies, is a very important zoonotic disease. Among wild animals, foxes, wolves, the American vampire and insect eating bats also carry the rabies infection. It is a virus infection which leads to acute encephalitis (inflammation of the brain) and death. Immediate washing of the bite wound and treatment with vaccine is recommended as a measure to prevent the disease.

Hydatid disease or hydatidosis, is serious and often fatal. It is caused by the eggs of tapeworm, shed in the faeces of dogs. Mixed with dirt, the eggs are ingested by man after contamination of foodstuffs. The eggs hatch out into larvae which invade the various organs forming large cysts. Treatment is difficult. For prevention, dogs should be regularly checked for worms and if found tape-worm infested, should be given treatment.

Anthrax is caused by a bacillus which can survive for years in hides, hair and wool of infected cattle, sheep, goat, horse and pig and their carcass. In human beings infection is contracted by handling sick animals and their by-products. Treatment with antibiotics prevents death, if diagnosed sufficiently early. Animals infected with this disease should be vaccinated.

Queensland fever or Q fever, caused by a micro-organism resembling to both bacteria and viruses, occurs commonly in sheep, cattle, and goat. Infection to human beings occurs through the excreta of infected ani-



Hydatid disease is caused by the eggs of tapeworm; shed in the faeces of dogs.

mals. It can also spread through the milk of infected cows. This disease is a serious hazard for dairy and slaughter-house workers. The patients normally recover without treatment but in severe cases antibiotics may be used.

Brucellosis, caused by Brucella organisms, spreads by contact with infected animals, or their products such as milk, meat or milk products. It causes intermittent fever and is curable with antibiotics and sulfonamide.

Tuberculosis of human beings and cattle are closely related diseases, caused by different forms of the

same bacteria. The human and bovine forms are reciprocally capable of infecting each other. The bovine form infects human beings when they drink raw milk of cows and goats. Pasteurization of milk kills the tuberculosis germs.

Animals are indispensable for human beings but great care should be taken whenever there are contacts between man and other species of animals. A sense of hygiene and cleanliness should be developed by all those who deal with animals of commercial importance and those who are fond of pets. □

SCHOLARSHIPS FOR THE HANDICAPPED

A provision of Rs 5 million is being sought by the Department of Social Welfare for disbursement as grants-in-aid to various voluntary organisations working for the rehabilitation of disabled people. The rate of assistance to these organisations will be up to 90 per cent of the total expenditure.

Another amount of Rs-2 million is being proposed for a number of scholarships for handicapped people. The objective of this scholarship programme is to help handicapped students secure necessary education and training as a step towards their rehabilitation. The scholarships are given for general education from IX class onwards as well as for technical training at diploma and

degree levels. Now the scholarships will also be made available to disabled persons doing correspondence courses. A special provision has been introduced for awarding stipends to deserving persons between the age group 14-40 years, working as in-plant trainees in approved industrial or commercial establishments. Students taking up research courses are now eligible for scholarships.

To bring the rates of payment more in line with current costs, the allowances have been raised by about 50 per cent. A special rate for students living in approved hostels has been introduced.

Over 6,250 handicapped persons will benefit by these scholarship schemes. □

DEMOCRACY DEMANDS DISCIPLINE

Shri Imam is Assistant Editor, *Science Reporter*, New Delhi.

Mallappa's mini-monsoon



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Salal Hydro-Electric Project

ASHOK OGRA

Salal Hydro-Electric Project is one of the most ambitious projects of the Jammu & Kashmir State whose commissioning would trigger off industrial development in the State. It is estimated that Salal Project would generate 690 MWs of power and thereby meet not only the State's demand but also supply power to neighbouring States who often experience power shortage during pre-monsoon months. With the industrial sector receiving top priority from the State planners now, the importance of Salal Power house has further increased. Estimated to cost Rs 1410 million Salal is expected to be commissioned by 1982.

POVERTY OF POWER has retarded Jammu & Kashmir's march towards economic growth. Despite having abundant water resources the State has lagged far behind in harnessing the same. Because of this basic constraint the State has remained industrially backward. At the end of the Fourth Five Year Plan the total cost of industrial products manufactured in the State amounted to a meagre sum of Rs 60 million only.

But of late, the importance of developing power has been recognised and efforts directed towards augmenting the power position of the State have been initiated. Construction of Salal Hydro-Electric Project is one such step that would create the primary

input for the State's future development.

The project site is nearly 105 km North-West of Jammu. What was a wilderness a few years ago is now bustling with men and vehicles. Roads zigzagging their way to the project site have been laid, and a residential colony to accommodate the staff and the workers has sprung up.

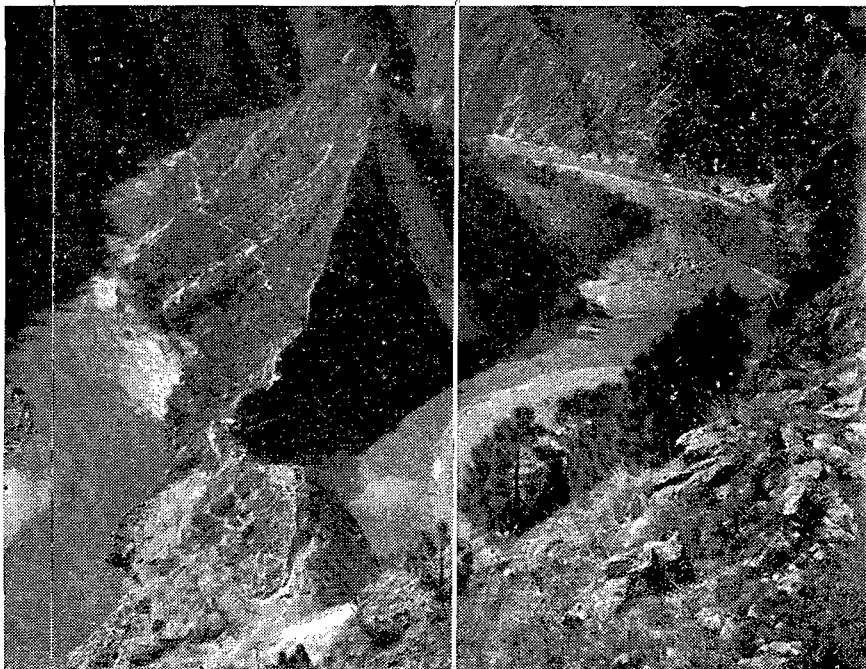
Salal is the first power project envisaged on the river Chenab that has more than 5 million kw of power potential. River Chenab, the largest in Northern India, originates from Himalayan regions. Its length from its point of origin to Akhnoor—a small town near Indo-Pak border—is 600 kms. At Salal Project site the

river drains a catchment of 21,947 sq. kms.

The idea of harnessing Chenab for power purposes first originated with Maharaja Hari Singh, the then ruler of Jammu & Kashmir. He entrusted the task to a British engineering firm and a tunnel was constructed at "Aas"—some 100 kms from Jammu. However this project of Hari Singh was later revised by the State Government when an investigation team of the J.&K. Power Development Department found the "Aas" site technically not feasible and recommended the present "Dyargarh" site. The revised project which was finalised by the State Engineers and approved by Dr K.L. Rao, the then Union Minister for Irrigation and Power, envisages the construction of a 115 metre high Rockfill Dam across the river Chenab in the northern limb of the Dyargarh loop, 65 metre high Concrete Dam over the ridge separating the northern and the southern limbs of the loop, and a diversion tunnel. The power house would be constructed on the right bank. Preliminary work was undertaken in 1970 and the actual construction started in mid-1971. One really wonders why this gigantic project was allowed to languish from 1921 to 1970.

The original estimate of the project proposed in October 1968 was put at Rs 550 million. The revised estimate put the cost at Rs 1129.7 million in December 1973. Due to increasing cost of men and materials, the estimate has sky-rocketed to Rs 1410 million now.

The project will be completed in



Shri Ogra is a Journalist, Srinagar.

two phases. The first phase envisages the installation of 3 units of 115 MWs each. The second stage provides for additional three units of 115 MWs each; which will materialise after the construction of Storage Dam on the main Chenab river upstream at Thirsot and on the Marsudara tributary of Chenab at Bursar.

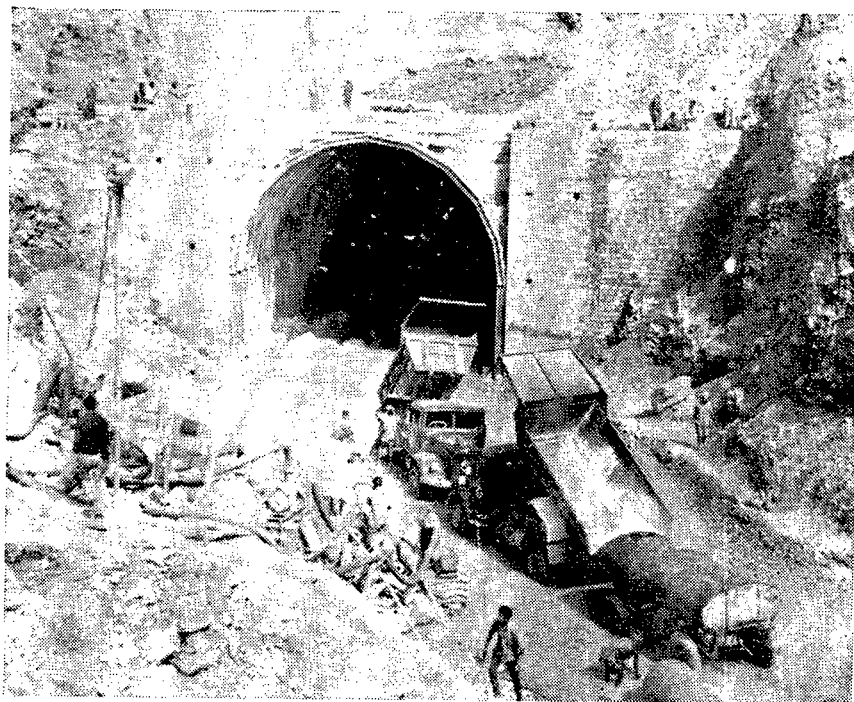
The project includes some unique features of design and engineering structures. The stored water would be used only for harnessing power and not for any other purposes. Thus the flow of Chenab would remain undisturbed. In this respect of having dead storage, Salal Hydro-Electric Project is the only one in the country.

Most of the hydel power stations in the State are dependent on the flow of the river. Generally, during dry seasons the flow of the river lessens resulting in shortage of power. Investigations have, however, revealed that River Chenab experiences little variations in its flow throughout the year, thus making it possible to have uninterrupted supply of water needed for the power house. The Salal project has also been designed in such a way as to moderate the intensity of Chenab so that it no longer poses inundation problem.

The power generated would be fed to the Northern Regional Grid and is proposed to be shared by the States of Jammu & Kashmir, Punjab, Haryana and Union territory of Delhi. By linking it to the Regional Grid, Salal would greatly help in easing the power scarcity during pre-monsoon months when due to depleted reservoir level, power availability is low.

The Centre has agreed in principle to form a corporation headed by a Managing Director to administer hydro-electric projects including Salal. Each project would be under the control of a Chief Engineer. Entrusting Salal and other hydel projects to a single organisation would lead to a greater specialisation which is imperative now that large and highly sophisticated units will shortly be in use. It would also lessen the chance of any particular project's work coming to a standstill due to financial difficulties as a corporation can always seek financial aid or loans from financial institutions.

The importance of Salal project has further increased with the creation of a new atmosphere in the State for industrial development as a result of fruitful consultations held by the state officials with outside



Top: A close-up of the diversion tunnel which will be ready by 1977 end. Bottom: The concrete dam getting foundation treatment

entrepreneurs recently. Several industrial projects are expected to start working soon. These include a wool plant, a scooter factory, and a factory to produce chemicals based on resin and terpentine in Jammu; modernisation of Government Silk Factory and diversification of HMT factory in Srinagar. Work on the 600 tonne-a-day cement factory is also being expedited.

Salal means a great deal to the people of J & K. It will not only meet the State's needs but also supply power to neighbouring States.

When finally commissioned, it would give employment to nearly twelve thousand persons. It was expected to be completed by 1979-80 but now the date has been postponed to 1982, though even this date is rather doubtful considering the present tempo of work. Except Diversion Canal that is nearing completion, work on the other project structures is still in its infancy; in the case of Concrete and Rockfill Dams only foundation has been excavated and in the case of power house excavation is still in progress. □



Young Men Form Voluntary Body to Dispel Legal Ignorance

NOBODY can escape the penal consequences of law, or the liabilities under it, on the plea of ignorance of law. But the vast majority of people is ignorant of law.

In fact, India's Minister of Law, Justice and Company Affairs, Dr. V.A. Seyid Muhammad, a noted authority on law, went further and declared the other day that "this is all the more so these days when a plethora of laws, regulations, rules, ordinances and notifications flood the country from day to day. Even the legal experts are often overwhelmed and bewildered by the enormous volume of laws and it has been found in some cases that neither the lawyers appearing for the parties nor the judges themselves, are aware of the innumerable regulations, rules, notifications, etc."

This state of ignorance becomes all the more significant when we take into account the various social legislations which are enacted for the betterment of the poor and illiterate masses. How many villagers and rural poor know that legislations such as the one abolishing bonded labour has been passed for their benefit?

A sample survey taken recently in Mysore, Bengal, Maharashtra and some other States disclosed that only 10 per cent of the people know about the new legislations

against bonded labour and dowry!

Indeed, the people of India need someone to tell them about the law, their rights and obligations under it, as much as they need the law itself.

It was to correct this very sad state of affairs that an organisation called the Association for the Promotion of Legal Knowledge, (APOLK), came into being in the Capital in 1974. The Law Minister's remarks quoted above were made at a function in Delhi on 14 May 1976 when he inaugurated the Lawyers' and Arbitrators' Wing (L.A.W.) of the Association.

Created by a band of young lawyers, company executives and college lecturers, the Association aims to give legal assistance to the poor, to promote legal literacy among the masses and to create in them an awareness of their rights and duties. With Delhi as their national headquarters they are now organising chapters all over the country. Dr Upendra Baxi, Dean of the Faculty of Law, Delhi University, is the chief patron of the Association.

The Association's Secretary-General Shri P.J. Koshy (a company executive), its Director of Legal Aid Shri C.N. Radhakrishnan (a post-graduate student of law) and its Director of Publicity and Public Relations Shri K.

Rajagopalan 'Rajan' (a college lecturer) are all in their 'thirties. The Association is the first of its kind in India to be registered under the Societies Registration Act.

The newly inaugurated Lawyers' and Arbitrators' Wing of the Association aims to cut the very roots of vested interest in law in this country: "Old and established lawyers themselves with a stake in high fees from long-drawn-out litigation",—in the words of Justice V.R. Krishna Iyer of the Supreme Court who had delivered a talk on 'the role of young lawyers in nation-building' at the inaugural function of L.A.W.

L.A.W. will render proper legal advice and will make sincere attempts to reconcile conflicting parties before the matter is referred to a court of law. And when arbitration attempts fail, they will make available expert advice and proper counselling through a panel of lawyers. It has already chalked up a number of successes to its credit.

Interested? You can get in touch with L.A.W. at their temporary office located at A-24, Parliament Street Courts, New Delhi 110001. The parent body, APOLK, functions from E-67, Amar Colony, Lajpat Nagar IV, New Delhi 110024.

—S.K.

QUOTATION BOX

From philosophy to religion, from Greek myth to original sin, from middle class morality to humanitarianism, everything throughout our history has contributed to the sanctification of work.

—Pierre Gascor
Winner of the Prix Goncourt award

Past attempts by governments to spread wealth through taxation have achieved little since wealth in modern market economics is seldom held in the form of cash. What really counts is establishing a co-operative economy system in which the ownership and control of land, resources and know-how is taken out of the hands of the few and made available to all.

—Shann Turnbull

In the West, we pay unemployment

compensation off the job, in Eastern Europe, they pay it on the job.

—Time

The mere prolongation of life, unaccompanied by an improvement in its quality, may not be as sacrosanct a goal as it appears in certain societies.

—Dr Halfdan
Director-General WHO

We appreciate Israel's dilemma in moving towards peace.

—President Ford of U.S.A.

If you want to produce a communist, send him to Paris. If it is a capitalist you want, send him to Moscow.

—African Student of Patrice Lumumba Peoples' University, Moscow.

Because Gerald Ford bumps into things it does not mean he is not as bright as a button.

—Mrs. Anne Armstrong, US. Ambassador to U.K.

If there has been a wheat revolution anywhere in the country it is in West Bengal. Punjab and Haryana are traditionally wheat-growing areas.

—Jagjivan Ram

The idea that to make a man work you've got to hold in front of his eyes gold is a growth, not an axiom. We've done that for so long that we've forgotten there's any other way.

—F. Scott Fitzgerald.

Under South African censorship, photographs of black breasts are allowed for publication. White breasts are banned.

—The New York Times

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GUJARAT

Accent on New Economic Programme

RAMAN PATEL

IN THE WAKE of President's rule, the administrative machinery in Gujarat has acquired both dynamism and imagination. The Governor, as the representative of the President, is very keen on implementing the new economic programme, which was hitherto receiving only lip sympathy from the Janata Front Ministry.

A 22 point guideline has been drawn up for the Popular Committees to be set up in all the villages for the implementation of the programme. These committees will comprise of village panchayat members, members of social justice Committee and some nominated members. A three member Watch Dog Committee, comprising Taluka Panchayat President, Taluka Development Officer and Mamlatdar will supervise the functioning of these committees. As the Governor pointed out, the significance of these committees is in the fact that, they will take the Prime Minister's new programme to the rural areas in such a way that it becomes a talk of every village. The committees are expected to bring about a complete socio-economic transformation in rural areas. They will propagate against the practice of untouchability in any form, help the authorities in maintaining public distribution system and help artificial increase in the prices of essential commodities, help in identifying the surplus land under the amended Land Ceiling Act, assist in the maintenance of the record of rights, and find out the transfer of lands which the non-tribals had somehow managed from the tribals.

All Round Improvement

The business and trading community had rigged up the prices of esse-

ntial commodities soon after the imposition of the President's rule, believing that the President's rule is no-body's rule. But they have been disillusioned by the actions taken by the administration. Instructions have been issued to district authorities to keep a watch over the price trend. This was no empty threat, as was proved by the actions taken by the District authorities of Rajkot and Jamnagar. In Jamnagar alone, for instance, the stock of foodgrains, vegetable oils and other essential commodities worth Rs 8 lakh was seized resulting in the arrest of two persons under MISA. As many as 1196 raids have been carried out during the last three weeks and 6 traders detained under MISA for hoarding and profiteering. This has had an exemplary effect and prices are now once again on the decline.

In a bid to keep the prices down, the administration has lowered the limit to hold foodgrains stock by an agriculturist from 20 quintals to 10 quintals. Accordingly, an agriculturist who holds in his possession, his own produce in excess of the limit prescribed has to declare his stock to the concerned Talati, in the event of foodgrains stock other than his own in excess of this limit, he shall have to declare it in writing before the concerned Mamlatdar. The District Collectors and Superintendent of Police have been asked to take stringent action including under the MISA against the hoarders and profiteers.

A food cell in the Police Department is being set up to specially look after the enforcement of the foodgrain regulations. The cell with suitable field staff at the District level and at urban centres, would start functioning shortly. The

Government has also ordered mass inspection of foodgrains and jaggery shops in Ahmedabad and other cities, to prevent hoarding and profiteering by traders.

20-Point Programme

The administration is giving utmost priority to the implementation of the new economic programme and a timebound schedule has been drawn up in respect of each point of the programme. As regards distribution of land to the landless, 52,000 acres of land had been declared surplus under the original land Ceiling Act, till December, 1975. Of this, about 40,000 acres of land has already been distributed and the remaining would be distributed before June end. A Land Reform Commissioner has been appointed with suitable staff, to co-ordinate various measures relating to land reforms.

As regards the implementation to the Urban Land Ceiling Act, the administration hopes to acquire all available surplus lands under the Act by June, 1977. A working group has been set up to suggest the optimum use of the land that will become available and the ways to find resources for it.

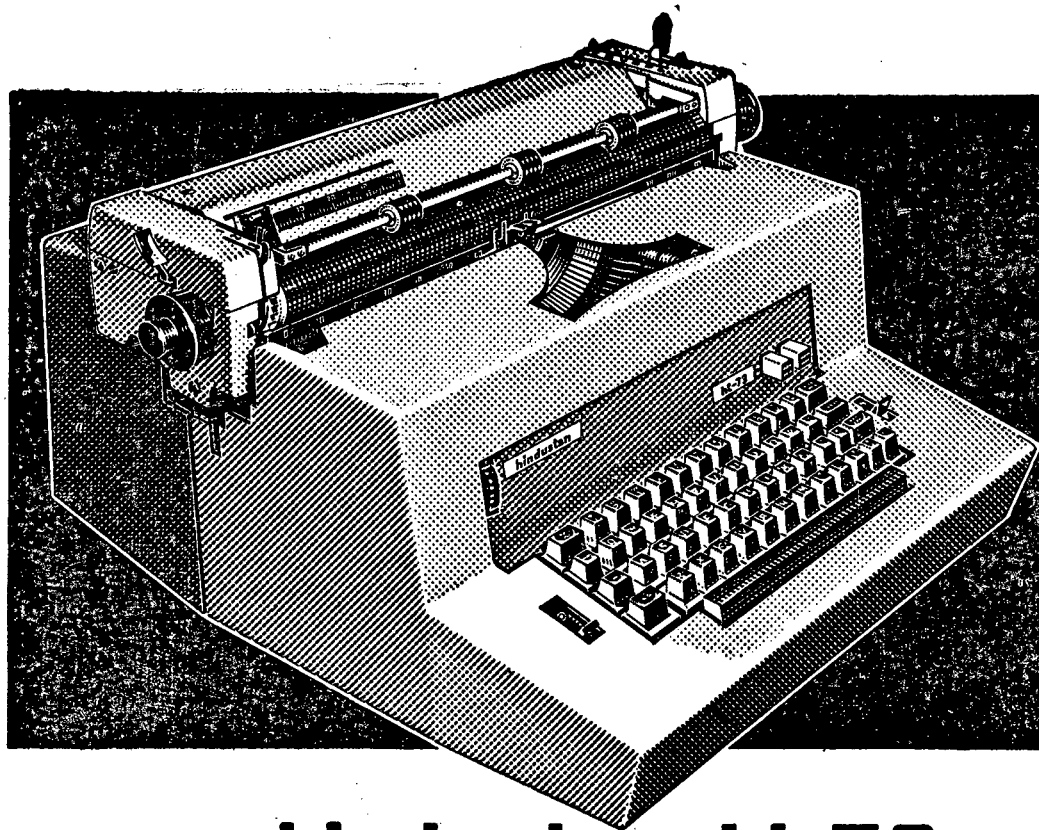
Under the scheme house-sites for the to landless 12 lakh persons have already been allotted housesites. Only fifty-four thousand applicants are on the waiting list.

More than 1300 schools and university hostels with a student strength of more than 1 lakh, are being regularly supplied with foodgrains and other essential commodities either at subsidised rates or at fair prices. This has resulted in the reduction of the Students' food bill. More than 1,55,000 students have been provided with free books.

To ameliorate the standard of living of the poor people the Government has so far revised the minimum wages of 21 categories of workers. In addition to the minimum wages, a special allowance would be paid at the rate to be decided by the competent authority, at every six month interval on the basis of the average cost of living index number.

Administrative approval has been granted to drill 215 tubewells in 91 "No source" villages in the tribal areas of 8 districts, at a total cost of Rs 27 lakh to supply drinking water to the public. There are about three thousand "No source" villages in the State. A phased programme to solve the drinking water problem in "no source" village is being worked out. □

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Breakthrough in Family Planning

ASSAM HAS TAKEN a long stride in the National Family Planning Programme during the last six months by achieving nearly 1100 per cent increase in sterilisations over the corresponding period of last year. That motivation, if properly conducted, can produce results has been amply demonstrated by Assam. Until last year, the performance of family planning in Assam was rather poor and was a matter of concern for the administrators of the programme in the State.

The change of strategy heralded in 1975-76 lays increasing emphasis on the involvement and motivation not only of doctors, paramedical staff and other workers in the family planning setup but also of the doctors and staff of the Medical Colleges, civil hospitals and civil dispensaries. Motivation hitherto was mainly confined to eligible couples but now the Assam Government has realised that better results can be achieved if proper motivation exists among those who implement the programme.

Instructions have been issued and individual targets assigned to everyone concerned with the family Planning Programme in Assam whether they are doctors or paramedical staff. It has further been stressed that the work would be judged by the practical results achieved. Accordingly, family planning services have also been expanded and care taken to ensure that these are efficient and dependable. Full satisfaction of the acceptors of FP is the watchword of the field staff. Effective supervision has also been ensured.

Effective Strategy

The fact that the State Government has been able to achieve 1090 per cent increase in sterilisations during the first six months of the year as compared to the performance during the same period last year, proves the effectiveness of this strategy. During the year 1975-76, 1,50,000 persons were sterilised in Assam as against the fixed target of 67,000. Results have also been encouraging in respect of IUD insertions, which have increased

from 1921 to 7708. The number of conventional contraceptive users has also jumped from 5,723 to 20,970.

After having thus activated the doctors and paramedical staff, the State Government has devised a method of picking up suitable cases out of the patients and their attendants coming to the out-patient departments of Primary Health Centres, civil dispensaries, hospitals and medical-college departments. This has appropriately turned O.P. Ds into catchment areas for selecting and motivating family planning cases. A mention of the marital status of the patient and the number of children (male and female) is made right on the out-door ticket itself. The doctor while attending to the patient and prescribing treatment also tells him to meet the family planning doctor/motivator sitting in the same building, if he or she is considered eligible for getting family planning services.

Target Crossed

Out of the ten districts, the work in four districts viz., Sibsagar, Dibrugarh, Nowgong and Kamrup has already caught up on the above lines and their performance has been very encouraging—with the result that the State has already crossed its annual target of 67,000 sterilisations within a period of six months only. This is all the more important because the first six months are generally considered to be lean months while the second half of the year shows much better results. Assam, therefore, looks forward to do still better during the coming winter months and has embarked on an ambitious plan for these months. In these months the State proposes to cover effectively and systematically the rural areas by organising mini-vasectomy camps at suitable places. The services are being geared up and the motivation drive is being launched with full vigour. Similarly, mini-tubectomy camps are also proposed to be organised in each civil hospital.

Assam has 13 million people living in the villages out of its total of 14 million people. As elsewhere in the

country their main occupation is farming. In the rural areas, therefore, effective use is being made of the weekly/biweekly Haats/Bazars that are held and where people from the villages come to sell their produce and purchase their household requirements. As these Bazaars are places of congregation of rural and tribal people, they constitute a very fertile ground for the family planning motivation. The State Government has taken effective steps to not only make use of these Bazaar for contacting and motivating people but also to provide on-the-spot services to those motivated.

This novel method has earned rich dividends. While the villagers come primarily for shopping many of them go back duly serviced and motivated. Many satisfied acceptors become motivators of their own accord and then bring cases on subsequent Bazaar days. The family planning staff looks out for them, welcomes them and is only too happy to provide them on-the-spot service.

Tea Gardens

Much of the success has come from Tea Gardens which hold a sizeable part of Assam's population. The labour population in the gardens is more or less a closed community, working and living in these gardens and having hardly any worthwhile contact with the outside world.

The tea gardens which are members of the India Tea Association have offered special incentives to their labour for accepting sterilisation. Rupees one hundred are given to the acceptor of sterilisation after two children, Rs. 70 for those accepting after three children and Rs. 50 to the acceptors having more than three children.

Another important step taken by the Assam Government which has contributed to this break through is the integration of the public health, medical and family planning services. The Government has eliminated the so-called distinction in the duties of the public health doctor and the family planning doctor in the PHC. Both of them are given equal opportunities to attend to public health as well as to provide medical care and family planning services. Both the doctors have equal targets for family planning work and they have to achieve them individually. This arrangement enables both the doctors of a PHC to attain proficiency in all types of work and share the burden equally by working in unison. □

BOOKS

Appraisal of World Economy

World Economic Profile Macmillan Company of India Ltd., Delhi-6; 1975; Pages 199; Price Rs. 65.

THE book under review has been brought out on behalf of the Birla Institute of Scientific Research, New Delhi. It comprises of 17 chapters on the major variables and sectors of economic growth covering a period of ten years from 1962 to 1972. This certainly is a commendable work inasmuch as the data presented countrywise have been analysed both in absolute figures and in ratios. The data are taken from authentic sources like the U.N. Yearbook, the ILO, the FAO Yearbook and so on.

Each chapter begins with a broad picture of the economy of nations and ends up with the relevant data and diagrams. The situation of the Indian economy has been dealt with more elaborately as compared with that of the developing and of the developed countries. In the totality of the analysis the *Profile* presents an explanation for the inhibited growth in Indian economy during the ten years of study, and fixes responsibility on external factors as well as in 'misplaced' priority of investment in the heavy industry sector. Inasmuch as the mass consumption goods like foodgrains, textiles, sugar, edible oils, etc., did not keep pace with national income, there was bound to be a sluggish growth of the overall economy. But then, Indian economy fared much better than the economies of other developing countries that are at the same level of development.

The study also points out that the high pace of growth in developed countries has pushed the world into an unprecedented crisis. Consequently, shortages of a number of critical raw materials have resulted in a rapid rise in international prices. In the present world perspective, development in countries like India will not be without strain. A major rephasing of development programmes is therefore suggested with accent on exports and import substitution.

In almost every chapter, there is a comparative study made on achieve-

ments and shortfalls as between the developed and the developing countries as a whole. Measured in terms of commodities, the wide differences in

the standard of living between the two, has come out quite sharply. The disparities have widened in the past twenty years. Although many of the developing countries are well endowed with national resources, the recent oil crisis has made them conscious of the scarcity of world's natural resources. Hence, a plea is made for a realistic reappraisal of present and future needs of resources for bringing about a better world economic order.

—Navin Chandra Joshi

Focus on Wage Structure

Occupational Pattern And Wage Structure in Indian Industries by Ravindra Nath; Sterling Publishers (P) Ltd., New Delhi; Pages 248; Price Rs. 58.

THIS is a scholarly study which focuses attention on wage structure and occupational pattern in different industries. In the first chapter the author gives an account of wages in Indian industries followed by a detailed study of wages in Poona industries. The study throws light not only on the numerical aspect of employment according to representative occupational groups, but also on the employment status, wages and earnings and concentration and dispersion of income in each industry. The study shows that the degree of concentration of incomes in different industries varies greatly and the industries with advanced technology are having great concentration.

In this study the author examines the wage structure in detail and works out dispersal, skewness and concentration of wage incomes as prevailing in Poona industries by using the statistical technique of co-efficient of variation and Lorenz Curve, which has been supplemented by the standard deviation by the logarithms of income as an industry which indicates the dispersion of proportional incomes.

The author has rightly suggested that the wage structure should be standardised through joint bodies of employers and employees. It is generally noticed that the wage structure is miserably low in a large number of Indian industries and there is an urgent need to improve it. The same is true of Poona industries where unions are weak and the membership is very limited. It has also rightly been emphasised that incentive schemes are essential for

promoting improvement in productivity. The trade unions in this country have been able to help the worker in improving his wage structure, but they look at bonus schemes with suspicion. The author has forcefully presented the case for the trade unions to help managements in the introduction of bonus schemes.

The effect of foreign collaboration on the wage structure has also been worked out in detail. The conclusion that the industries with foreign collaboration have a very high concentration of income at the top is amply supported by the analysis.

The suggestion that the major portion of dearness allowance should be merged with the basic wage is timely. As dearness allowance is linked with the cost of living index numbers, same uncertainty is introduced in labour cost of production. It further narrows down the occupational wage differentials and reduces incentive to the worker for going into those occupations where more skill is required. The Labour Bureau should look into the matter urgently.

The author has done well in pinpointing the reasons for the growing unemployment—the main reason being lack of coordination between plan programmes and the training programmes. This simple fact has been ignored until now. The inter-industry technique has been utilised to project the future requirement of manpower in different occupations and the author has suggested a way out of bottlenecks created by shortage of skilled personnel or unemployment due to over-emphasis on training programmes.

The book has the recommendation of no less a person than Prof. V.M. Dandekar, Director, Gokhale Institute of Politics and Economics, Poona.

—M.M. Mathur

A Look at Land Reforms

Land Reform, Welfare and Economic Growth by Dr. Baldev Singh Sidhu; Vora & Co., Bombay, 1976, pages XVI+271 Price Rs. 30

THE FIELD OF Land Economics is the arena of conflict between positive and normative judgments held by various schools of economists. For an Indian scholar writing on this theme for a doctoral dissertation in a British University there is nothing short of a phenomenological paradox to overcome and not merely lack of up-to-date data. Large slices of development economics with its customary outfit of concepts and approaches reappear in the seven chapters of the book as an inevitable paraphernalia for window-dressing. Chapters 3 and 4 deal with our land reform measures in two phases 1951-61 and 1961-71. The new start made in this field might well dispel the sense of pessimism with which he has ended this treatment of complex issues. It is also not unlikely that the logical pursuit of economic analysis in the field in the years 1972-76 might convince him about the great role that political leadership plays today in our national setting (e.g. the recent Chief Minister's conference addressed by the Prime Minister herself) and the formidable multiplier effect of psychological motivation at various levels in making people *will their own good* and translating this into action under the guidance of the state machinery.

The author views land reform as a deliberate change introduced with the system of land tenure and the farming structure. He sees little merit or advantage in restricting land reform to the creation of peasant owner-farmers or the pooling of land into cooperative units or State farms. The excessive emphasis placed on the green revolution since the middle year of the Second Five Year Plan (1956-61) has led to the sidetracking of a basic change in policy. While living abroad the author naturally shared the displeasure of his mentors about the rhetoric on *Green revolution*, etc., but pleads all the same pragmatically for a direct link between the development projects and land reform programmes. There cannot be any difference of opinion when the author seeks answers for the question in the context of the policy dilemma

for the choice of techniques. His main poser has been this: "How far the capital intensity can be extended at any given point of time, given the production capacity of the Capital Goods Sector and needs of employment of the labourers?" His answers are grouped under two categories of introducing (1) in some regions peasants *cum* capitalist organisation carefully controlled by the State and (2) in other regions introducing co-operative organisation which leaves scope for private incentives.

The author has clearly highlighted the impasse resulting from initial adherence to the tenets of capitalistic farming based on the use of hybrid seeds and chemical fertilizers. While not overlooking the possibilities of revamping this trend for generating agricultural surplus through viable farms superior in organisation and yielding taxable profits, he also underlines the problems of unemployment and the sharpened effect of this situation on differences among economic classes. Land Reform's chief plank should be efficiency as the basis of reorganised farming structure and not the redistribution of land or reducing the ceilings of progressive farmers who assist in modernising agriculture. The size of 75-100 acres for the Punjab farm is considered optimal for efficient agricultural operation. The classification of Indian States attempted by the author as a prelude to his suggestions for reorganisation takes into account three important characteristics: (i) average area per rural household, (ii) rural labour household as percentage of all rural households and

(iii) percentage of people below the poverty level. The approach here is too tenuous on several grounds of statistical feasibility and credibility (See Table 21, p. 224). The availability of the Report of the All-India Agricultural Census 1970-71 should now assist in reaching proximate conclusions on this score. The more recent NSS Surveys also help the inquiring mind.

Compulsory consolidation of holdings to promote larger operational holdings, restriction of leasing in and leasing out of land by small farmers so as to afford this facility to those who have farms below 5 acres, the registration of ownership holdings and operational holdings above 15 acres, the enforcement of minimum wage legislation on these farms, the organisation of trade unions of farm labourers, the encouragement of private farms, etc., are some of the far reaching recommendations. The plea for a regional approach based on a realistic appraisal of the needs and possibilities constitute the major contribution of the book.

A modified version of the doctoral dissertation at Leeds University (1971-73), the thinking is largely based on factual analysis drawn from secondary sources and with the presentation limited to the synthesis of viewpoints of other scholars with commentaries thereon. However, the earnest and straightforward manner in which the ideas have been framed and presented with supporting data retain its elements of high utility as accessory reading material for undergraduate students of Indian economics. This well written book also gives 22 useful Tables, 2 appendices and a good bibliography leaving one serious lacuna of an index.

—B.N. NAIR

BOOKS RECEIVED

Social Accounting for Developing Countries by P.L. Arya, the Macmillan Company of India Ltd., Delhi, Price Rs. 45.

Social Assistance in India by K.M. Sharma, the Macmillan Company of India Ltd., Delhi, Price Rs. 35.

Cooperative Democracy in Action by O.R. Krishna Swami; Somaiya Publications Pvt. Limited, New Delhi, Price Rs 40.

A Report to the People. Government of West Bengal, Calcutta.

Prospects and Problems of National Capital Region, Punjab, Haryana and Delhi Chamber of Commerce and Industry; Price Rs 40 (Library edition).

Taxation of Agriculture in India by P. K. Bhargava; Vora & Co. Publishers Pvt. Limited, Bombay; Price Rs 20.

Development Notes

Modernisation of Agriculture in Nagaland

Foodgrain production in Nagaland is expected to touch, 1,00,000 tonnes during 1976-77. The current annual plan envisages an additional production of about 5,000 tonnes.

The first development plan in Nagaland began with the Fourth Plan, and the main strategy was to wean away the farmers from jhuming to permanent terrace cultivation through demonstrations, subsidy and use of machinery. While the Fourth Plan target of foodgrain production in the State was fixed at 80,000 tonnes, the production in 1973-74 was 81,700 tonnes. In 1973-74, sugarcane production also exceeded the targets laid. It was 39,200 tonnes. The level of foodgrain production in 1974-75 went up further, which was again improved in 1975-76, raising the total production to the level of 90,690 tonnes.

There is extensive prevalence of Jhuming or shifting

cultivation in the State. Of the total cultivated area of about 1,08,000 hectares only 29,000 hectares are under terrace cultivation. Nearly 75 per cent of the cultivated area is still under jhuming.

About 7,500 hectares were brought under terrace cultivation during the Fourth Plan. An additional area of over 1,000 hectares of land was brought under permanent terrace cultivation in 1974-75 and about 1,500 hectares in 1975-76. This year another 1,270 hectares will be brought under permanent cultivation.

The State Government has placed considerable emphasis on increasing production per unit area of crops in the State through cultivation of high yielding varieties, good management, converting the single-cropped area into double cropped area and development of horticulture and cash crops, besides continuing the tempo of expansion of area under permanent cultivation.

DSP Achieves Its Target

During the financial year 1975-76, Durgapur Steel Plant (DSP) has come out with a production of one million tonnes of ingot steel crossing marginally, the target set for the year. The production of 10,00,732 tonnes of steel ingot during the year, achieved after about a decade is an increase of 22.1 per cent over the production of 8,19,341 tonnes attained in 1974-75. This growth rate is outstanding. Production of 7,51,113 tonnes of saleable steel in 1975-76 is also a record performance and registers an increase of 44.3 per cent over the production of 5,20,369 tonnes achieved in the previous financial year. Despatch of 7,77,742 tonnes of saleable

steel is an all time best performance. This exceeds the despatch figure of 5,55,523 tonnes achieved in 1974-75 by 40 per cent.

The most encouraging feature of the production performance is the outstanding achievements attained in the last half of the financial year. During this period the plant operated at an annual rate of more than 1.1 million tonnes of ingot production. Production figures for almost all the units during the period works out to be higher than the annual target.

Another feature deserving special mention is the reduction in off grade production of ingot steel to 1.5 per cent against 6.4 per cent in 1974-75.

Incentives For Weaker Sections

The Central Government has formulated several schemes for providing additional incentives and facilities to the weaker sections of the society and to potential investors through the provision of essential inputs and services. A programme of modernisation of 40 selected industries covering about 40,000 units has been undertaken.

This centrally-sponsored scheme will have an employment potential of 2,00,000 jobs during the Fifth Plan

period. Priority is being given to entrepreneurs in selected backward districts.

Intensive development campaigns have been conducted to assist and guide entrepreneurs in the establishment of small industrial units. The scheme is gathering momentum and a large number of industrial units are coming up in the backward regions in different States. Growth of ancillary undertakings which would produce components and parts

for large-scale units is being encouraged.

A number of measures of far-reaching importance have been taken in the recent past for the expeditious development of small-scale industries. The focus has been on the development of entrepreneur-

ship, specially in the backward and rural areas. The Government had announced in May 1975 a revision of the investment ceiling in the definition of small-scale industries from Rs 7.5 lakh to Rs 10 lakh and ancillary industries from Rs 10 lakh to Rs 15 lakh.

Civil Engineers' Consultancy Organisation

A Civil Engineering Consultancy Service (CECON) has been set up under the Council of Scientific and Industrial Research. CECON is a consortium of six national laboratories of the CSIR. One of the objectives of the CECON is to provide international consultancy services in civil engineering, especially to developing countries.

In tune with this objective

of CECON, some of the reputed civil engineering organisations in the country who are bidding for turn-key jobs in the developing countries have expressed interest in securing the design consultancy services of CECON. It is in negotiation with such organisations for this purpose. CECON will also act as a Consultant to other Engineering Consultancy firms.

House-sites For Landless

Over 55 per cent of the landless workless in rural areas in the country have been provided with housesites. According to studies carried out there are about 110 lakh families eligible for the allotment of housesites out of which over 61.13 lakh families have been provided with housesites. Over 30 lakh housesites have been allotted since the declaration of emergency, of which over 3.7 lakh are developed ones.

The highest number of housesites, over 22.45 lakh have been allotted in Gujarat followed by over 11.47 lakh in Uttar Pradesh, about 8.52 lakh in Madhya Pradesh, over 7.06 lakh in Bihar, over 5.91 lakh in Rajasthan, 5.50 lakh in Karnataka, over 5.36 lakh in Tamil Nadu, about 3.03 lakh in Punjab, 3.55 lakh in Maharashtra, about 2.98 lakh in Andhra Pradesh, about 2.74 lakh in West Bengal and over 1.58 lakh in Haryana. The landless rural workers have also been allotted over 22,000 housesites in Tripura, over 33,000 in Kerala, about 15,500 in Orissa, over 8,500 in Assam and over 4,000 house-

sites in Himachal Pradesh. Over 12,000 housesites have been allotted in the Union Territory of Delhi followed by 592 in Dadra and Nagar Haveli and 112,102,22 and 11 housesites in the Union Territories of Pondicherry, Goa, Daman and Diu and the Andaman and Nicobar islands and Chandigarh respectively.

Out of over 3.79 lakh housesites developed, the largest number of over 1.25 lakh are in Karnataka followed by over 84,000 in Kerala, 43,000 in Maharashtra, 41,000 in Gujarat and about 39,000 in Tamil Nadu.

Besides the allotment of these housesites, several States have taken a number of steps to assist the beneficiaries in the construction of houses on the plots allotted to them because the economic conditions of the majority of the workers is very weak and they cannot construct houses on their own. Realising the situation, many State Governments have also linked this scheme with the scheme for construction of houses involving mass participation.

Fillip To Handloom Sector In Tamil Nadu

An export-oriented handloom project at Karur and an intensive development handloom project covering two centres—Kancheepuram and Erode have been launched in Tamil Nadu. The projects are estimated to cost Rs 22.5 million.

An expenditure of Rs 5 million for the Karur project, involving a thousand looms, will be entirely met by the

Centre. For the other project, 60 to 65 per cent of the total expenditure of Rs 18.5 million will be met by the Centre over a period of five years.

Under the intensive development handloom project, the Karur Centre covers 5000 looms over a radius of 25 miles and the Kancheepuram Centre, another 5000 looms.

New System For Limestone Exploration

The Cement Research Institute of India has worked out a rationalised system of prospecting, exploration, reserve estimation and technological assessment of cement grade limestone deposits. The system meets the long-felt need of a standard yardstick for realistic prediction of the quality and quantity of limestone during exploration.

The work has been accomplished with the active collaboration of the Geological Survey of India, the Geological Bureau of Mines, the Indian Cement Industry, the Cement Corporation of India and experts from various other organisations.

The application of the new guide norms would improve the raw material resources of the cement industry, optimise

reliability and grade of limestone deposits, reduce the exploration costs and minimise the risk element in setting up new cement plants. These guide norms are all the more significant and timely when large-scale expansion is being planned in the country's cement industry, particularly for big cement plants with capacities ranging over 2000 tonnes per day.

During March this year, 23 new weavers' cooperative societies were organised and over 14,000 handlooms brought into the cooperative fold through the new and existing societies. At the end of March, a total of 1,65,000 looms were covered by 783 cooperatives. Efforts are underway to revitalise 85 weak and dormant societies.

Consumer Cooperatives To Manufacture Woollen Hosiery

The consumer cooperative sector will soon take up the manufacture of woollen hosiery goods. The National Co-operative Development Corporation has sanctioned a project costing Rs 625,000 for the manufacture of woollen hosiery goods at Ludhiana, Punjab. The total production capacity of this unit will be 32,000 woollen pullovers per month. This will involve a sales turnover of Rs 2.4 million. The first woollen hosiery unit in the cooperative sector, it will be set up by the Punjab State Federation of Consumer Cooperatives.

The National Cooperative Development Corporation's

new programme of assisting consumer cooperatives in setting up consumer industries will cover such projects in other States as well. The Corporation has already sanctioned a rice mill to be set up in Karnataka by the Mysore Consumer Store. The Chintamani Cooperative Store in Tamil Nadu will also be setting up an oilseeds processing complex, complete with a solvent extraction plant, under the NCDC scheme. During the current financial year, the NCDC proposes to spend Rs 250 million on consumer industries in the cooperative sector and for expanding the distribution network in rural areas.

FCI'S Namrup Expansion Project

The Namrup Expansion Project of the Fertilizer Corporation of India has gone into production. The Plant started producing ammonia for the first time from April 23, 1976 followed by urea in the next few days.

The Planning & Development Division of the Fertilizer Corporation of India did the complete design and engineering of the plant. Licence and process design for the Vetrocoke CO₂ removal section, ammonia synthesis loop and urea synthesis were obtained from Technimont of Italy. The Planning & Development Division was also responsible for procurement, inspection of equipment, supervision of erection and commissioning of the project.

Site construction was carried out by FCI's Project Organisation at Namrup.

The most remarkable and creditable features of the Project are maximum utilisation of indigenous fabrication and manufacturing facilities; utilisation of full range of catalysts (with the exception of synthesis catalyst and active carbon for desulphurisation) developed by FCI's Planning & Development Division; and the adoption of new generation concept using centrifugal compressors in single stream of ammonia plant and recovery of waste heat from process at high pressure and temperature for use in compressor drives.

When fully commissioned, the Namrup Expansion Pro-

ject with three times the capacity of the existing plant, is expected to produce 1,98,000 tonnes of ammonia and 3,30,000 tonnes of urea per year. The Plant uses associated gas from Naharkatiya and Moran fields as feedstock and fuel.

The total cost of the Namrup

Rice Bran For Food Oil

Plans are under way to promote production of food grade oil in India from rice bran, the most important by-product of rice milling industry. Rice bran oil has so far been largely used in the country for industrial purposes only, because of its high free fatty acid. Technology is now available in the country as a result of research done by Central Food Technological Research Institute (CFTRI), Mysore, to prevent the rice bran from becoming rancid. Rancidity is prevented in the bran by stabilizing the bran for which a stabilizer has been developed by CFTRI, costing about Rs 15,000.

The process has been demonstrated to many rice mil-

Expansion Project is estimated at Rs 675 million with a foreign exchange component of Rs 250 million. Suppliers credit to the extent of about Rs 200 million was available from Technimont who has supplied the imported equipment.

lers. The bran stabilizer unit installed at the Food Corporation of India's rice mill at Sembanarkoil in Tanjavur District, Tamil Nadu, is reported to be working satisfactorily.

There is a plan to set up a few bran stabilizers in Punjab, Madhya Pradesh, Andhra Pradesh and Tamil Nadu, to demonstrate both economical and technical advantages to the millers. The de-oiled bran would be a good constituent for balanced animal feeds. The three organisations that are collaborating in the project are the CFTRI, the Food Corporation of India and the Paddy Processing Research Centre, Tiruvarur.

EPI Secures Turnkey Contract In Iraq

A sophisticated mechanical workshop will be set up on turnkey basis in Iraq by Engineering Projects (India) Limited (EPI), under an agreement signed with the Iraqi project authorities. The project is of the value of about Rs 110 million.

With this project, the number of overseas projects that EPI has on hand are 12 valued at Rs 400 million. These projects are located in Iraq, Kuwait, Europe, and in South East Asian countries.

EPI already has regional offices in Kuwait and Baghdad

and is going to set up another at Bangkok for intensifying marketing efforts in South East Asia. Two more regional offices are expected to be set up shortly to accelerate further the thrust for export of turnkey projects.

EPI has already implemented 34 turnkey projects of the value of Rs 1300 million in India which include sugar projects, bulk material handling projects, different types of large size industrial furnaces, and low temperature carbonisation and coal gasification plants.

Leather Units Earn Foreign Exchange

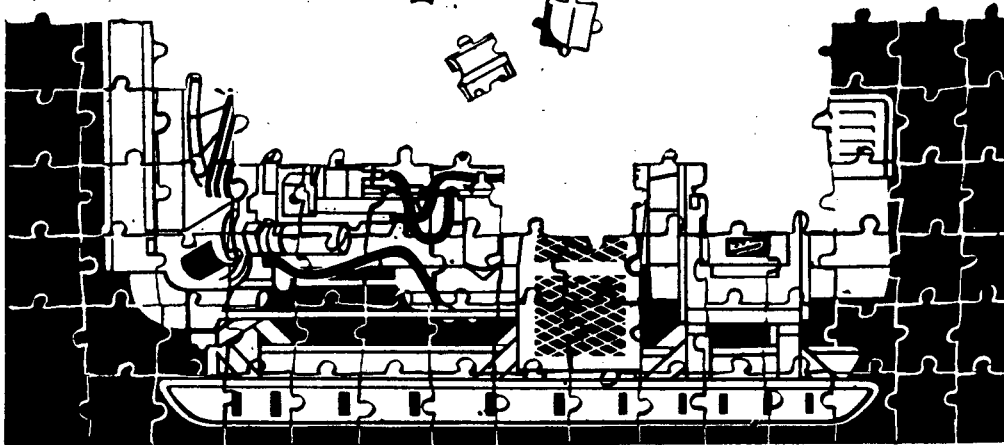
Indian footwear, leather garments and other leather goods are in great demand in foreign markets, particularly in Russia, the USA and Tanzania, etc. The share of footwear units financed by the Khadi and Village Industries Commission (KVIC) through the state khadi and village industries boards, in these exports is steadily increasing from 1974 onward. Their total exports being approximately Rs 1.5 million during 1975-76. Out of this total amount, 20 fabricators working under the Bharatiya Charmodyog Sangh Agra, which is under the direct control of the KVIC, contributed Rs 0.5 million approximately.

Besides, there is vast scope

for Kolhapuri chappals in foreign markets, which are presently manufactured at Athani in Karnataka. Ever increasing volume of exports of these colourful and fascinating leather articles has been instrumental in providing gainful employment to hundreds of tanners and footwear workers who easily earn Rs 10 to Rs 20 per day.

The KVIC has been providing technical help to 20 fabricators at Agra and 10 leather cooperative societies at Karnal which produce quality export goods. The KVIC also gives financial aid for the purchase of improved tools and equipment as well as provides working capital loan to these societies.

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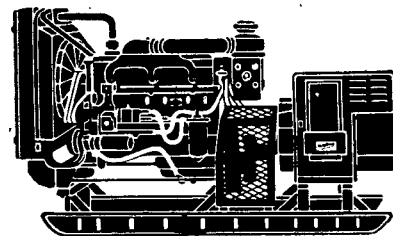
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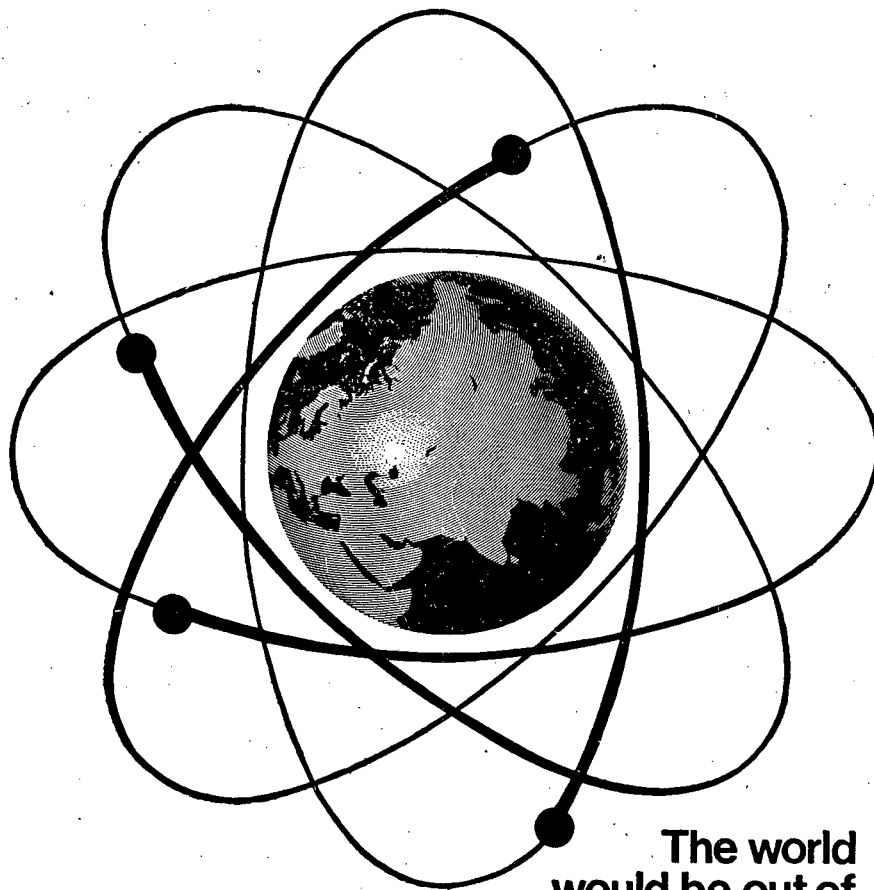
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Special Issue

Cities,
Poverty
and Work



**The world
would be out of
its element if India
had not generated
atomic thought**

Today the world is in its element as it finds itself in the atomic age. But the discoveries of modern times echo the atomic theories of ancient India—theories that were brilliant explanations of the physical structure of the universe. An atomic theory was taught by Pakudha Kātyāyana an older contemporary of Buddha. Indian atomic thought thus originated before Democritus the great Greek philosopher—one of the founders of the atomic theory. In physics and other spheres Indian talents have enriched the world. We at L&T continue the tradition by enriching life through industrial development. The source of our energy is the vast reservoir of technical know-how generated over 35 years. It has spurred us on to manufacture equipment for India's nuclear power projects. The reactor vessel, fabricated for the first time in India, is an example. In order to foster the growth of nuclear power, we have set up modern fabrication facilities; formed a specialist cell for handling design, fabrication, application of new techniques. We are a vast industrial complex designing, manufacturing, installing plant and equipment for every vital industry. The secret of our success lies in the individual talents of over 10,000 people in our associate and subsidiary companies and our network of offices all over India.

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Chief Editor

S. SRINIVASACHAR

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Editor : N. N. Chatterjee. Assistant Editors: N. G. Chaudhry, Swatantra Radhakrishnan. Senior Correspondents : AHMEDABAD—Raman Patel, BOMBAY—Avinash Godbole, CALCUTTA—P.B. Ray, GAUHATI—P.K. Chankakoti, HYDERABAD—V.K. Sastry MADRAS—Poornam Viswanathan, TRIVANDRUM—Rosscoe Krishna Pillai. Correspondent : Siddharthan Kariyal. Photographic Officer : P.K. Kapoor. Sub-Editor : Jasbir Batra. Advertisement Manager : D. Krishna Rao. Editorial Office : Yojana Bhavan, Parliament Street, New Delhi-110001. Telegraphic Address : Yojana New Delhi. Telephones : 383655, 387910, 385481. extensions 402 and 420. Circulation : Business Manager, Publications Division, Patiala House, New Delhi-110001. Subscriptions : Annual—Rs. 18, Two years—Rs. 30, Three years—Rs. 42. Foreign Subscriptions : One year—£1.80 or \$5.50. Two Years—£3.00 or \$9.00. Three years—£4.20 or \$12.50. Single copy—Eight pennies or \$0.25.

EDITORIAL

Fruitful Cooperation

AS Prime Minister Mrs Indira Gandhi pointed out at her press conference in Moscow last week, the significant thing about Soviet aid to India's development has been that it helped India's public sector. This country wanted to build up its economic infrastructure by establishing steel, heavy electrical and heavy machine-building plants and most of the help came from the Soviet Union. The other significant thing about Soviet help was its timeliness. When our need was for laying the foundations for basic industries and power, the Soviet Union came forward; and when our need made itself felt in areas such as satellite technology, then also she came forward. The Soviet Union indeed has a reservoir of experience India can draw upon, as indeed she has the understanding and generosity to open that reservoir whenever we have felt the need for it. This is the kind of enlightened cooperation that India has always advocated between the developing and developed societies, sans political strings.

Starting with the participation of an Indian delegation which included Dr C.V. Raman in the bi-centennial of the USSR Academy of Sciences in 1925, Indo-Soviet cooperation in science and technology has covered a gamut of fields including metallurgy, oil, coal, non-ferrous metals, power generation, power equipment production precision instruments, pharmaceuticals, seed development and multiplication, animal husbandry, lasers, crystal growth, cybernetics, magneto-hydrodynamics, petro-chemistry, water conservancy, standardization, geo-physics, the chemistry of natural products, the biology of plant pests, micro-pulsations, meteorology, communications, radiation, statistics, solar and geothermal energy and space technology. This vast field of co-operation in fundamental and applied science has helped free us from neo-colonialist dependence, and has helped us forge ahead in fields where the profit motive by itself could not have taken us. The vision and ideology that give impetus to this kind of co-operation is, strangely enough, more Christian than Marxist: Thou art thy brother's keeper. And the word 'keeper' has its full Biblical meaning and not that imparted by the man who keeps colonies of bees or poultry.

The declaration signed at Moscow on 11 June 1976 by India's Prime Minister Mrs Indira Gandhi and the General Secretary of the Soviet Communist Party Mr Leonid Brezhnev, reflects the full Soviet appreciation of the efforts of the people and the Government of India in trying to solve the complicated socio-economic tasks that they face. The declaration also emphasizes the need to explore new areas and modes of cooperation. The declaration, in effect, ratifies the rational and scientific approach to development as it should exist between any developed country and a developing one. It shows how confrontation and conflict, be they economic, social or political, can be overcome with understanding and a willingness to cooperate and help. In this sense Mrs Gandhi's visit to the Soviet Union has been a memorable event, one more forward step in the direction of peace, international cooperation and the achievement of the one world idea.

The necessary ingredients for building up a strong and self-reliant economy are present in the Indian economy. But to achieve this transformation we have to make the best use of the present which alone can ensure a bright future.

PERSPECTIVE OF ECONOMIC GROWTH

SANKAR GHOSE

Union Minister of State for Planning

THE MAJOR OBJECTIVES of planned development in India are removal of poverty, attainment of social justice and achievement of an increasing measure of self-reliance of the economy. In the light of past experience in the formulation and implementation of Five Year Plans, there has been increasing recognition that growth and social justice, far from being opposed to each other, should go hand in hand. The result is that we have opted for a pattern of growth which will be consistent with social justice.

Planning involves a scientific diagnosis of our basic problems, identification of needs and the removal of bottlenecks to the process of development. Implementation of Plan programmes involves corrective measures at all stages and for curbing the initiative and enterprise of the people, Indian planning seeks to utilise the initiative of the people on an extended scale. Widespread participation by the people in the economic and social activities of the nation is a concrete manifestation of the democratic urge of the people.

A crucial indicator for judging the speed of economic growth is the rate of growth in national income. The net national product at constant 1960-61 prices grew by 51.5 per cent between 1960-61 and 1973-74 or at a compound annual growth rate of 2.8 per cent; the growth rate was 3.3 per cent during the Fourth Five Year Plan period as compared to 2.6 per cent during the Third Five Year Plan. The per capita net national product has risen from Rs 305.6 in 1960-61 to Rs 347.2 in 1973-74 at 1960-61 prices, registering an increase of 13.6 per cent.

A sustained high rate of growth in any economy requires structural changes involving rapid growth of the secondary and tertiary sectors as also of the primary

sector. The rate of growth in foodgrains production in the country during the period 1961-62 to 1973-74 was 2.67 per cent compound per annum. If fluctuations are averaged out, this rate is estimated at 3.16 per cent. On the other hand, the index of industrial production showed an increase of 5.5 per cent compound per annum in the period 1961 to 1973. The tertiary sector also expanded during the period.

The Earlier Plans and the Fifth Plan

In the earlier plans the long-term objectives were set out in aggregative terms of growth of national income, consumption and investment on the basis of assumptions regarding growth of population, marginal rate of saving and capital output ratios. However, the Draft Fifth plan provides for the long term perspective of 12 years (upto 1985-86) along with the projections for 1978-79 at a more disaggregated level than in the past, bringing out the implications of development within a coordinated, internally consistent framework. The projections for the Fifth Five Year Plan as well as for the long term perspective periods were obtained through a system of economic models consisting of a macro-model, an input-output model, and a consumption model. The Draft Fifth Five Year Plan postulated an annual growth rate of 5.5 per cent for the Fifth Plan period. In this Draft Plan the long term perspective was postulated with an average annual rate of income growth of 6 per cent for the Sixth Plan period and 6.2 per cent for the remaining two years of the perspective period.

The Years of Strain

The Indian economy, however, went through a period of severe economic strain during the last two years caused by the sharp rise in the domestic and international price levels, and slow growth of the economy and deterioration in the terms of trade. Some of these

Based on a speech at the seminar at the Annual Conference of the All India Manufacturers' Organisation on May 15, 1976 at New-Delhi.

adverse developments were beyond the country's control. The original Plan targets and expectations were affected as a combined result of these factors. However, because of the determined leadership and right mix of policies vigorously pursued, the country has to a considerable extent overcome these adversities and the economy is now poised for a higher rate of growth. There is clear evidence to show that the economy has made a sharp break with the stagflation which afflicted the nation's economy during 1972-74.

The different types of anti-inflationary measures undertaken by the Government not only contained the price level, but brought about a continuous decline in prices since the second half of 1974-75. In fact it is a matter for national pride that ours is one of the very few countries in the world which have controlled domestic inflation within such a short period.

Record Production in 1975-76

The year 1975-76 witnessed a record foodgrain production which is anywhere between 114 to 116 million tonnes as compared to the previous year's production of about 101 million tonnes. The rate of growth in foodgrain production ranges from 13 to 15 per cent, an all time record for the country. On current indications a buffer stock of about 11 million tonnes is indicated. This is indeed a happy situation.

Industrial production also has improved considerably from mere 2.5 per cent growth in 1974-75 to a 4.5 per cent during 1975-76. Taking into account improved power and raw-materials situation and favourable labour relations, a rate of growth which is considerably higher than that of 1975-76 is expected for the coming year 1976-77. As for production levels in some of the key sectors, it may be mentioned that production of coal has increased from 88 million tonnes in 1974-75 to over 98 million tonnes in 1975-76. Cement production has also increased from 14.5 million to around 17.0 million tonnes. Finished steel production which was 5.5 million tonnes in 1974-75 is expected to have increased to over 6 million tonnes in 1975-76. Fertilisers which are the other important inputs for agricultural growth have also shown encouraging improvement from 1.5 million tonnes to 1.8 million tonnes during the above period.

It is also heartening to note that for the third year of the Fifth Five Year Plan the provision of Plan outlay made at Rs 7852 crores is nearly 31 per cent higher than the outlay proposed for the previous year. This is an all time record in rate of growth of any one year's plan outlay. As compared to the position at the end of March, 1975 when our foreign exchange reserves including gold, SDRs, stood at Rs 969 crores, the level at the end of March, 1976 is likely to be around Rs 1900 crores.

The Indian rupee has also grown stronger recently. The rupee has been delinked from sterling and its foreign exchange value is determined under a new arrangement with reference to a weighted average of exchange rate movement of currencies in India's major trading partners. The value of rupee vis-a-vis sterling has been improving. As of April 1976 the Indian rupee and sterling pound exchange rate was fixed at Rs. 16.90 paise as compared to Rs. 17.25 paise earlier. Besides, the domestic purchasing power of rupee is also increasing in the context of a stable price situation in the country.

The New Economic Programme

The announcement by the Prime Minister of the action oriented new economic programme in July,

1975 reaffirmed the Government's commitment to accelerated growth and greater social justice with reasonable price stability. This has brought about substantial improvement in the growth prospects of the economy in the coming years as compared to the economic aberration witnessed in 1973-74. The 20-point programme is an effort to put the economy back in shape. This programme has ushered a new and dynamic period of intensive activity in many key walks of our life. The complementarity between an orderly political system and a healthy and expanding economy has now become only too obvious. The lack of discipline at all levels, worsening industrial relations and the dominance of the economic machinery by non-economic forces had surfaced in various forms, interrupting the normal production process. The economic order was also being seriously threatened by the functioning of a parallel economy backed by black money. The economy, therefore, needed a shot in the arm and it was precisely this which was provided by the Prime Minister's 20-point programme.

This programme has brought a new sense of awareness among the people of the need to improve efficiency and to fully utilise men, machinery and materials with the object of increasing output, to speed up transport and to keep down manufacturing and operational costs. There has been spontaneous response both from the workers and employers and from all sections of society to this programme.

The new economic programme emphasises that expansion of irrigation facilities is a pre-condition to the effective implementation of the spread of the new technology in different areas of the country. Additional irrigation potential by itself creates the capacity for additional foodgrains production. Thus, the emphasis under this programme on irrigating an additional five million hectares through major and medium projects and on the utilisation of the ground water is an important element in the development strategy of the country. Up-dating land records, implementing agrarian reform measures, abolishing bonded labour, providing house-sites for weaker sections and related measures contemplated in the 20-point programme could be used to focus developmental programmes towards strengthening the dispossessed sections of our society.

The prospects on the supply front have undergone substantial improvement during the last few months. The availability of various basic inputs like steel, coal, power, cement etc. has steadily improved. A lot of punch has been added to the power and irrigation programmes.

Judging by the available indicators as well as by the determination that is now evident in removing the bottlenecks in the path of the nation's march towards progress, it is clear that the economic growth prospects of the country are reasonably bright. Given the improved position in reserves of crucial inventories such as foodgrains and the production potential being built up or already in stream, it should be possible to sustain larger investment efforts in the remaining periods of the Fifth Plan.

The overall rate of growth of the economy during the perspective period will be naturally influenced substantially by the growth rate in the agricultural sector. Growth of agriculture depends heavily upon irrigation and fertilisers which are the two most essential inputs. The creation of irrigation facilities is therefore given an important focus in the Fifth Five Year Period and beyond. It is proposed to intensify ground water exploration including the arid regions and drought prone

regions so that with adequate knowledge of the ground water potential it will become possible to undertake crop planning as well as regional planning for rural development. As regards fertiliser use, a detailed analysis is being made to estimate the requirements for different crops taking into account factors like extension of irrigation facilities, increase in areas under different crops, use of high yielding varieties of seeds and also of new technology. In the context of the present conditions and in the light of the policies and programmes implemented under the New Economic Programme, a higher growth rate in agriculture is within the country's capabilities and can be achieved with continued efforts.

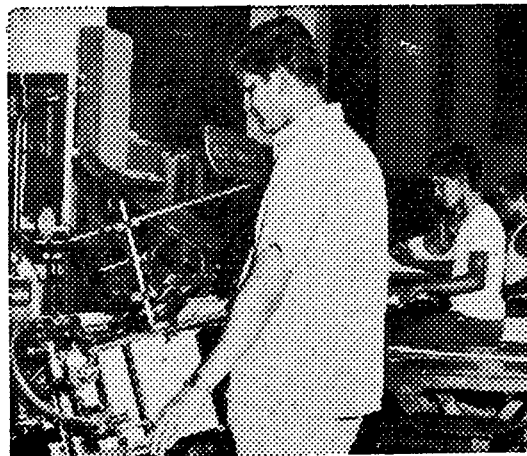
Industrial Development

The pattern of industrial development demands growth of income, consumption and investment and the possibilities of foreign trade. A consistent structure of production levels of different manufacturing industries has been worked out and it is expected that the manufacturing sector would grow at a faster rate during the Fifth Plan period and beyond than in the past. The factors limiting the growth rate of industrial sector in the past have been on both demand and supply sides. Shortages of critical raw materials and power coupled with insufficient demand had resulted in unutilised capacity in the industrial sector. Inadequate investment in certain key sectors had also contributed its share to low levels of output. To remove these deficiencies the measures that have already been taken are to step up public investment, to devise appropriate fiscal and monetary measures to stimulate private investment and to rationalise procedural formalities in order to ensure speedy implementation of different projects. These steps would simultaneously assure adequate and timely availability of critical raw materials and also provide the necessary effective demand for the output. The success of these measures is already visible in the performance of the major industrial sectors in the last year. There has been considerable improvement in the utilisation of capacities and a significant increase in output especially in the public sector undertakings.

The balance of payments position poses a challenge to our long term strategy. The key to the solution of this problem lies in expanding exports as well as in pursuing a selective policy of import substitution, specially of intermediate manufacturers and capital goods. The recent experience on the export front clearly demonstrates the capabilities of Indian exporters. With the incentives now available for exports and the opening up of new markets in the OPEC and East European countries, it should not be difficult to achieve greater heights in exports both in the traditional as well as new markets. Similarly, the dependence on imports especially for intermediate products is likely to be reduced in the future as a result of the creation of additional capacities for production within the country of items like crude oil, fertilisers, iron and steel, non-ferrous metals, etc. Given the above favourable factors, the country's balance of payments situation is expected to improve considerably.

Population Control

A rate of growth of around 6 per cent compound per annum for the perspective period and sustained over a number of years later upto 1985-86 can produce a perceptible impact on the life and living standards of the people. The results would be more marked and noticeable if at the same time the rate of growth of population is brought down. The long term strategy, therefore,



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QUOTATION BOX

It is for the people to judge who is truly patriotic and oppose all forces, whether inside or outside, which oppose the unity of the country.

—Indira Gandhi

We missed the industrial revolution; we don't want to miss the technological revolution

—Y. B. Chavan

Planning for the future becomes worthwhile when change is perceived as being possible.

—WHO Chronicle

Indian planning seeks the exercise of initiative by people on an extended scale by speeding up growth and creating conditions for widespread participation of the people in the economic and social activities of the nation.

—Sankar Ghose,
Minister of State for Planning.

History should be a record of what people did, not what people did not do.

—Prof. R. K. Dasgupta
of Delhi University

Kings and princes have always got rather nice treatment in Peking.

—G.P.D. in the
Economic and Political Weekly

Perhaps this German-born Secretary of State (Dr. Kissinger of USA) could escape from his apparent Weltschmerz if he remembered that he is, after all, an American now.

—The Economist



IGNORAMAN

*wants to know
whether the place for the
corrupt is in the bars or
behind the bars.*

What really struck me was that everybody was making their chapatis on their individual fires instead of going to a central baker. This means that manure which should have been used for fertiliser is consumed as fuel. A lot of progress can be made if farmers begin to change their social customs.

—Dr N.A. de Ridder
UNESCO Consultant

Cherrapunji's housewives would not buy one (solar cooker) even as a toy.

—Editorial in The Statesman

We all know how many times a critic reads a book. Less than once.

—Marvin Bell in The Nation

Europe's Kings and queens are the Houdinis of History.

—Time

The Chairman (Mao Tse-Tung) has not forgotten his own dictum that power grows out of the barrel of a gun, but seems to think it all the more necessary at this stage to keep his power under ideological control.

—Editorial in The Statesman

US foreign policy isn't a job for babies and it isn't a job for bullies.

—Gerald Ford

The weapon against malnutrition is not a discovery but a step from discovery to industrial production.

—Ceres

Civilization and humanity cannot flourish in midst of darkness. Our will and our character can attain perfection only by continually overcoming darkness, physical and mental.

—Zail Singh, C. M. of Punjab

Darkness is not dispelled by cursing but by lighting lamps. Along with international efforts for peace, each country must act on its own to reduce areas of suspicion and to enlarge areas of goodwill.

—Indira Gandhi

Both of us (India and Pakistan) are playing cricket. But this time we are not playing for a draw. Both of us are going to win.

—Jagat Mehta

Mechanised Farming

A Widow shows the way

BHUGLIBAI, a widow from Birra village in Bilaspur district of Madhya Pradesh, had to face the problem of earning a livelihood, when her four sons got separated and, as a result of the division of land, her share came to single hec-

tare. Acting on the advice of the Gram Sewak, she got a loan of Rs. 5,000 from the SFDA and got a pumpset installed for irrigating the land.

The yield in the first harvest was more than the previous year's. Next

year it got doubled. She easily paid back instalments of loan with interest. In the last season, she obtained a yield of 20 quintals per hectare of paddy and 16 quintals per hectare of wheat. Considering the land, wheat-growing in Chhatisgarh is not easy and yet she went for it and made a success of it. The secret lay in taking to improved techniques of farming. Out of her savings she has purchased about two hectares more of land and hopes to produce still more from her holdings. □

attaches great importance to speedy and effective steps for control of population growth. While sufficient resources have been allocated for family planning programmes, vigorous and intensive measures have also recently been taken all over the country in pursuance of the statement on national population policy. Thus the objective of removal of poverty through creation of more employment opportunities and increased purchasing power to the poorer sections of the population is closely linked

with growth prospects as well as with the control of population growth.

Taking an overall view of all the facts of the economy, there is considerable evidence to support the view that the necessary ingredients for building up a strong and self-reliant economy are present in the Indian economy. But to achieve this transformation we have to make the best use of the present which alone can ensure a bright future. □



THE SALMALI

M. KRISHNAN

THERE ARE MANY trees growing wild in the hills and along rivers that people do not know, but the red silk-cotton, though it is an authentic forest tree, is well known. It has a name in every Indian language—over the best part of north India it is the *simal*, and in Sanskrit it is the *salmali*. Along with the *khair* and the *sissoo*, it is typical of sub-Himalayan riverain forests, but it also grows in other forests and away from rivers, all over India, in fact, except in the drier tracts. It is often seen along the coast, both on the east and the west, but undoubtedly it attains its most magnificent stature where the soil is well-drained and well-watered.

It is a towering softwood, well over a hundred feet tall in favourable locations, with the laterally spreading branches coming out more or less at

right angles to the robust, buttressed bole, and even when it is in thick leaf its identity is clear from its shape—the digitately lobed leaves, a brilliant, translucent green when young, are also distinctive. But it is in summer, when it sheds all its leaves and bursts into red bloom, that it is suddenly transformed from a lofty, impressive tree into a breathtaking pageant.

Hundreds of conical, soft-green buds appear on the twigs of the outspread crown, and open into great, stellate flowers of the richest crimson, with their centres crowded with masses of red stamens. The flowering of the red silk-cotton is the sign for a host of birds to flock to it to sip the nectar from the big, thick flowers, fully five inches across—mynas and bulbuls of many kinds, orioles, even crows, squirrels besides the birds.

Both my pictures, taken a thousand miles apart, show the same bird at the tree in flower, a common myna, and give a true idea of the size and thick-petalled heaviness of the bloom.

I shall say nothing of the utilitarian virtues of the tree, the use of its wood for match-sticks and packing-cases or of the silk-cotton from the pendent fruits, but would like to add that apart from offering a rich banquet of nectar, it is a tree much liked by forest animals. Monkeys and giant squirrels are fond of the young pods, before the fibres inside them harden, and birds that nest in holes in the wood like its thick, mast-like bole.

That brings me to its botanical name. For centuries it was familiar to foresters and botanists in India as *Bombax malabaricum*, but during the recent revision of taxonomical nomenclature, the name was changed

**you
need**
THE GREEN EARTH
By M. Krishnan

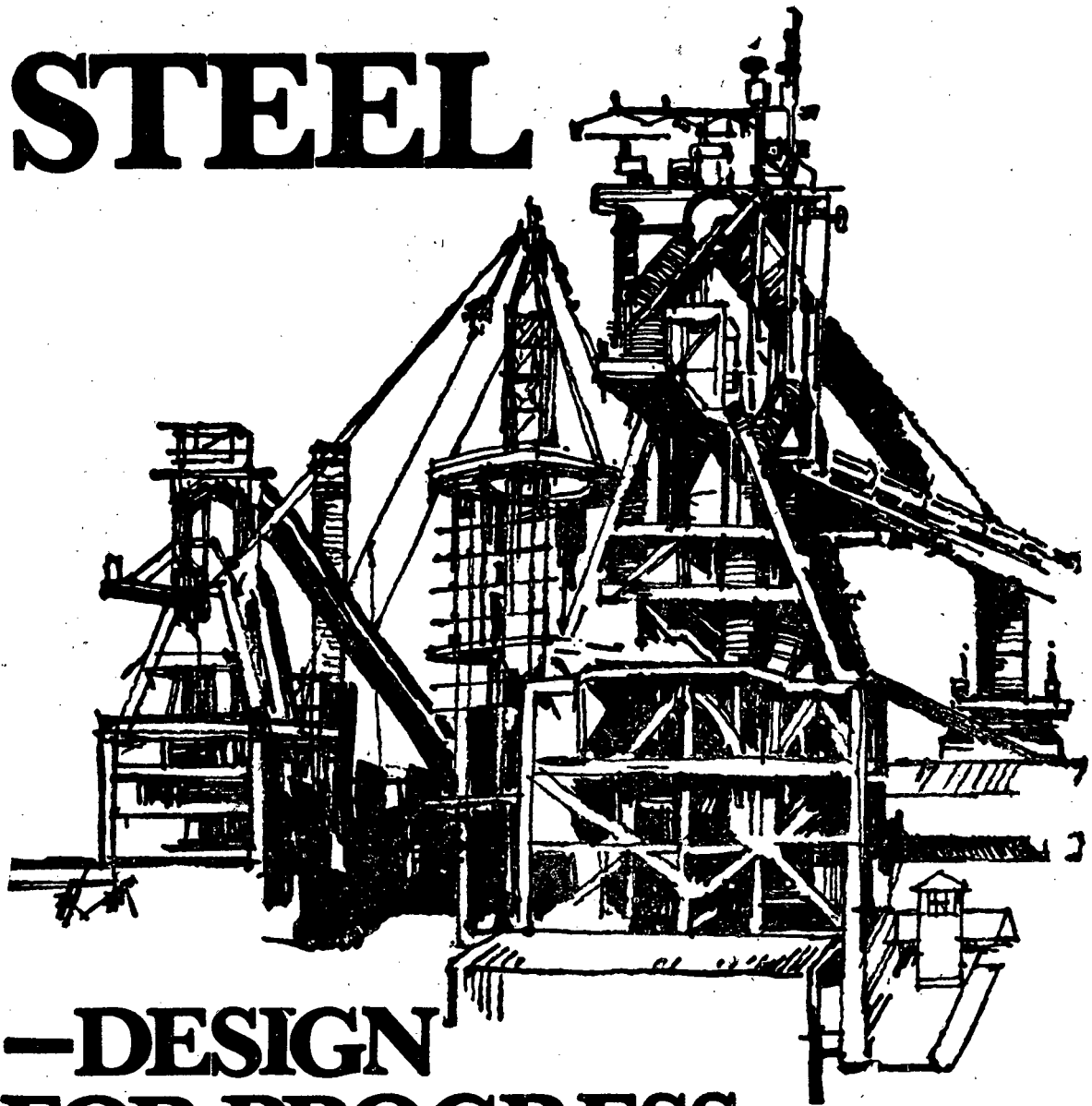
to *Salmalia malabarica*. Many felt confused by this sudden change, but a friend of mine, a botanist of international renown and a man with a deep feeling for the arts and our ancient culture, was delighted with the change to its classical Sanskrit name. One summer day, as we rested prudently in the shade of a banyan and admired a great *salmali* in full bloom across the road, he burst into sonorous Sanskrit, and since I do not have the language, translated the lines from Bilhana's poetry that he had recited, how sharp but deeply satisfying was the clash of colours between the brilliant green of parakeets nesting in a giant red silk-cotton, and its load of regal crimson flowers.

Unfortunately for my friend, they have changed the name again, and now it is *Bombax ceiba*. □

15 June 1976



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THE core of the Third World's poverty is lack of work. About 300 million people in developing countries either have not jobs or

else do work which is so unproductive that they cannot earn enough to support themselves and their families at a decent standard.

A NEW PATH FOR DEVELOPMENT

Where Should We Begin ?

JOHN COLE

Before the end of this century, unless there is a dramatic change in the way we run our world, another 1,000 million people will be added to the roll-call of the desperate. Unless the problem of unemployment and underemployment can be solved, there is little hope of breaking the cycle of deprivation which afflicts, from one generation to the next, the poorest 40 per cent of the Third World population.

Where do we begin? The world is not lacking in ideas; the difficulty is to persuade people to put ideas into operation. In order to tackle that problem, the International Labour Organisation is holding a World Employment Conference in Geneva from 4 to 17 June. It will seek to propagate the new strategy which has emerged in the past five years among development experts, and most notably from the ILO's own research and comprehensive employment missions to seven developing countries.

A strategy for the poor

The strategy represents a sharp change of direction from the policies which most countries have been following since the Second World War. It was understandable, particularly after independence, that countries in Asia, Africa and Latin America should seek to emulate the path of development which had created the high living standards in the industrial world. To do this they

John Cole is Deputy Editor of *The Observer*, London

would have had to squeeze into a single generation the industrial revolution which, in the West, had spanned two centuries. This was impossible.

They concentrated on the growth rates in the small modern industrial sector of their economies, in the hope that this sector would pull the rest of the nation to prosperity with it. But it has now become obvious that this will not happen: at best, such a development path would leave the next two or three generations of the poorest people still impoverished. Some argue that it would be worse than this, that even after another two or three generations the gap between rich and poor in the Third World would be widening rather than narrowing.

By contrast, the new strategy is aimed at the basic needs of the poorest people. Essentially, that means giving them the kind of work which will provide a roof over their heads, sufficient food, and other elementary human requirements: decent water supply and sanitation, schools for their children, medical care and transport to take them to work or market.

Employment is the key

One startlingly simple fact lies at the centre of the new strategy: to help the poorest people, you must provide work where most of them are. Probably four-fifths of the people in the Third World still live in rural areas, so the international organisations are now directing their primary

efforts towards agriculture and rural industry. But chronic poverty in the countryside has already driven millions of people into the slums of the great cities, and an additional effort is needed to build up the small-scale industries and services which are the only hope of livelihood for these people.

All this represents a sharp change of emphasis, which has not yet been fully accepted by all governments in the developing countries. They are being asked to concentrate their efforts not on the comparatively well-off people in the modern sector of their economies—who often have most of the political influence—but on people who, in terms of politics, are of no importance at all. It means a drastic redistribution of wealth and influence *within* the Third World.

But it would also require sacrifice from the industrial world. It is useless for the poor nations to develop their agriculture and small-scale industry unless they can find markets for their products. More trade among the developing countries will provide some markets, of course, but if they are to make a real economic breakthrough and dramatically improve the living standards of all their people in one generation, they need help from the rich world.

Objective: to cure poverty by 2000

Initially, that means aid—much more than at present, and directed to the right kind of projects. But it also means freer trade—in commodities,

The Poor in the Third World...

processed agricultural products and manufactured goods. That, in turn, implies a new international division of labour. The rich world will have to face the problems created for its own industry and agriculture by the ability of the Third World to produce more cheaply and efficiently items which were once a monopoly of the West. The rich countries are going to have to move gradually out of industries like textiles, footwear, leather goods, and some branches of electronics,

because the developing countries now have what the economists call comparative advantage in these industries.

The task, for both rich and poor countries, is daunting. But the alternative to a great co-operative effort to cure the world's worst poverty by the year 2000 is a niggling, ungenerous human race, waging economic wars or even armed conflicts over the diminishing resources of the planet. □

Can They Survive?

MORE AND MORE people in the Third World are pouring into the cities. Many of them are forced to go. Perhaps the family farm is too small to sustain all the brothers and sisters of a large family, so some have to leave and seek a living in the city. Perhaps the Green Revolution, ironically, has hurt rather than helped them: a large landowner can make more profits by ejecting his tenants and farming with the help of large inputs of fertiliser and the kind of mechanisation they cannot possibly afford.

There are a dozen different reasons why they leave, among them the oldest reason of all: the adventurous spirit of the young, who want to go off and seek their fortunes in the cities.

However, there is no fortune at the end of the journey for many city-dwellers, voluntary or involuntary, in the poor countries. They finish up in the huge slums of the major cities of Asia, Africa or Latin America. Only two out of five can hope to find jobs in the modern sector. The rest will drift into what economists call the informal urban sector of the economy, eking out a subsistence living as odd-job workers. Many millions of such people are undernourished, with an appalling incidence of disease and infant mortality.

Room for 1,000 million

The problem is likely to get worse. In 1950 only 16 cities in the Third World had populations over one million. There are now more than 60, and by the year 2000 there will be at least 200. By that date, it has been estimated, one in three people in Asia and Africa will live in cities. In Latin America, the process is further advanced. The growth of cities like Rio de Janeiro, São Paulo, Buenos

Aires and Santiago appears unstoppable, and by 2000, three out of every four Latin Americans will probably be living in cities. Throughout the Third World, the cities may have to find room for as many as 1,000 million additional inhabitants.

Can they survive? On present development patterns, the answer must be "no". Most governments in the developing world are still clinging to the hope that they can expand their manufacturing industry so rapidly that it will absorb millions of new workers. They tend to blame the illiberal trading policies of the rich countries for their slow progress, and think that if there could only be a new international economic order, removing the obstacles to trade, all might yet be well.

This is much too simple and optimistic, however. Too much of Third-World industry consists of indigenous firms or multinational companies which have developed their manufacturing behind high tariff walls, and with exchange rates, credit facilities and tax policies tailored to their needs. In some cases, this is a sensible way to get industry started in a developing country, but it does not necessarily produce efficiency in the short-term. At any conceivable pace of development, it will provide work and wages for only a tiny fraction of the city-dwellers of the next quarter-century.

Drastic change

Development experts are now urging governments in the Third World to change their development paths drastically. One of the first documents in this field is the report of the International Labour Organisation's employment mission to Kenya. It pointed out that the small family or one-man businesses of the Nairobi

or Mombasa slums provided great opportunities for capital accumulation, as well as for the development of ingenuity and enterprise—qualities which are common among the members of Kenya's largest tribe, the Kikuyu, but which are often not allowed to develop.

Poor people in Nairobi earn their living in 'bewildering variety of ways. They make shoes out of old motor tyres. They carry on automobile repair businesses on street corners, bringing their tools and even quite heavy equipment in with them each day. They are street traders and cooks, scavengers and sweepers, café owners or taxi drivers. There is what amounts to an alternative culture, for many of the goods and services are provided by poor people and for poor people.

Indeed, it sometimes seems, in Nairobi and other major cities of the Third World, as if the authorities wanted to "forget their informal urban sector," as the economists who led the ILO Kenya mission put it. Whereas in Calcutta, half-a-century and more ago, the small engineering shops were encouraged to develop—and in Japan, Korea, Hong Kong and other Asian countries, much of the post-war growth started with the small men—too many city councils still put endless obstacles in their way. The licensing regulations are awkward and sometimes corruptly administered. The health standards—on paper at least—are impossibly high. The bulldozers have wiped out many little businesses and the housing estates which surround them.

Help for slum-dwellers

What the slum-dwellers of the Third World need is more imaginative help. They ought to be given encour-

agement to improve their shanty homes, at least until such times as their governments have the money to provide better ones. They ought to get their share of the international aid: in industrial sites, credit, help to create marketing co-operatives, access to appropriate technology. The multi-national companies should be encouraged to promote local

industry by training people and then allowing them to set up as sub-contractors.

These are the kinds of ideas the ILO hopes to propagate, both among Third World governments and among concerned people in the industrial world, when it holds a World Employment Conference in Geneva from 4 to 17 June. In the end, the

adoption of such ideas would help everyone, for if the slum-dwellers of the burgeoning cities in the poor countries can be helped to earn reasonable wages or profits, they will be able to buy the products of the richer countries also. But they need help, not the cold shoulder of indifference or hostility. □

Intermediate Technology

*Only its judicious use and in the right circumstances, could
the situation be saved from worsening*

PAUL HARRISON

DURING MOST of the 1960s development for the Third World meant rapid industrialisation. Importing advanced technology and building big factories in the cities would produce fast growth and enable the products of developing countries to compete on world markets—or so it was hoped. Only in recent years did doubts begin to arise, as the poor became poorer and rural masses left the land for the cities, where they found massive unemployment.

Could it be that the advanced technology, used in the wrong circumstances, was actually worsening the situation? If so, what can be done about it?

THE ILO's World Employment Conference will ponder these questions, which have been also preoccupying many researchers. Among them is Dr. Ernst Schumacher, the founder of the London-based Intermediate Technology Development Group.

Dr. Schumacher, now 65, saw the nature of the problem more than 20 years ago when he was economic adviser to the Burmese Government. "The three great evils the Third World suffers from are mass unemployment, mass migration to the cities, and hunger," he says. Ernst Schumacher believes that Western

industrial technology was designed for societies where capital is plentiful and labour scarce, and is therefore often quite inappropriate for the Third World, where there is too much labour and not enough capital.

The result of introducing big capital-intensive industry in the cities of the developing world has often been to make the products of traditional craftsmen, like weavers, potters or blacksmiths, uncompetitive in price and in quality. One factory may employ a hundred fortunate workers, yet ruin the livelihoods of thousands of others. "The result of unbalanced development of this kind," Dr. Schumacher says, "is that a fortunate minority has had its fortunes greatly increased, while those who really need help are left more helpless than before. Nothing succeeds like success, and nothing fails like failure."

The aim

The answer could lie in "intermediate technology", a term Dr. Schumacher coined. It is called "intermediate" because it is halfway between traditional and advanced technology; it is designed to be much more productive than the first, but much cheaper to introduce than the second. Its cheapness means that many more jobs can be created

for the same cost. The aim of intermediate technology is to create millions of jobs, not in the cities, but in the areas where most people are living now—that is, in the Third World's two million villages. Production methods must be efficient, but simple, so they can easily be mastered by the relatively unskilled workers of rural areas. And wherever possible, local materials are used to save on import and transport costs.

With these goals in mind, the Intermediate Technology Development Group (ITDG) has been searching out cheap but effective technologies. Some of them have had to be developed from scratch—others were already being used in one country but were not known elsewhere. Through its lists of techniques and its journal *Appropriate Technology*, the ITDG has originated or publicised hundreds of simple devices and machines, from grinding stones to entire mini-factories, in all fields from energy to building materials, from farming techniques to ways of storing water. And, through its consultancy and project services, it has helped to install these devices in the field.

Inventions

One important invention the group has publicised is the animal power

We believe

THAT



Our Defence Forces must be equipped with up-to-date, reliable and sophisticated electronic systems. BEL supplies communications systems, gun-control and fire-control radars to the Army; radar systems, combat information systems and gunfire and missile control systems for the Leander class frigates of the Indian Navy; air-defence radar systems to the Air Force.

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gear unit, which harnesses the strength of draught animals such as bullocks to drive other machines. Two animals turn a long beam around a central gear unit, which transforms their slow movement into as many as 135 rotations per minute: a shaft led out from this central unit can drive threshers, oil presses, grinding mills or whatever. And all the metal parts can be rough cast from scrap iron by any village blacksmith.

Building methods and materials have been a rich source of ideas from the group: advanced methods are often too expensive to produce a house that people can afford, and cement adds to import bills. Techniques have been devised for making building panels out of compressed wheat or rice straw, and even for building quite stable houses out of thousands of used tin cans, covered in tarmac sheeting.

Intermediate technology can bring prosperity to impoverished rural areas, it can increase the productivity of labour, improve incomes and spending power, stimulate local small industry and save scarce foreign exchange by replacing imports. In spite of these advantages, intermediate technology has aroused hostility. Some critics say that it is an attempt to impose inferior or outdated techniques on the Third World, and to withhold the very best available.

Prosperity for rural people

Dr. Schumacher replies that it is usually only the new rich elite who raise these arguments, because they are the ones who profit from big industry. Another argument is that more capital-intensive techniques produce greater output and therefore speed up economic growth. Dr. Schumacher points out that

plants which are highly productive in theory may, in practice, often stand idle or underused because of shortages of skilled labour and management or spare parts from abroad.

But doubts like these are now less common. More and more governments, and international agencies such as the International Labour Organisation, are placing increasing emphasis on the use of intermediate technology in the Third World, where it is clearly shown to be economical both in money terms and in social costs.

In appreciation of this the ILO has put the problem on the agenda of its forthcoming World Employment Conference. The ILO wants to establish a small body of experts who will co-ordinate the work of national and regional research institutes and give the poor countries the benefits of technology which meets their needs. □

Education and Rural Employment

An overhauling of the school system which does not afford unrealistic expectations, is imperative

HENRY CASSIER

TWENTY-FIVE YEARS ago there were 16 cities in the developing countries with populations of one million or more. Today there are 60 and there may be more than 200 by the turn of the century.

How has this happened? The International Labour Organisation places equal blame on population explosion and migration from the countryside.

The crucial issue of stemming the rural exodus will be a major topic at the ILO World Employment Conference at Geneva in June. One remedy the meeting may prescribe is to restructure educational and vocational training systems for country dwellers which have failed.

Henry Cassier is Consultant to the World Bank Group & ILO on rural education and employment

Discouraged and frustrated, many children in rural areas of developing countries are being forced to discontinue their education after primary school because of low grades. Joining the ranks of the voluntary and involuntary dropouts, these children already consider themselves failures.

However, the failure is not in the children or their families, but in a school system which raises unrealistic expectations of city employment and government positions, yet fails to promote those attitudes and qualifications needed to make a living by working the land.

School is not the answer

It would, however, be unfair to blame the schools for something they were never set up to do. Compulsory schooling in the countries of the west

(which set the pattern for developing countries) did not arise from the needs of rural development. Rather it served to destroy traditional rural society and to build up the kind of labour force required by industry, and by the modern State. Hence it is futile to expect schools to promote employment, greater productivity and well-being in rural areas through concentration on agriculture. Their contribution to rural improvement is largely limited to developing those skills and attitudes suited to industrialised and commercialised agricultural enterprises, to the growth of non-agricultural activities in rural areas, or to migration toward employment elsewhere.

Nor is it the purpose of primary schooling to prepare pupils for direct employment. Its objectives are long-range: the provision of basic capaci-

ties designed to last a lifetime. Yet the needs of employment are short-range and constantly changing. Inevitably there is a mismatch between educational aims and the immediate demands of employment.

Peasant families are well aware of this contradiction. In Ghana's Upper Region, for example, where traditional agriculture is the mainstay of the family, numerous schools have been closed because parents keep their children home to work on the land, convinced that education will alienate and uproot them. Other parents of the same region, however, with insufficient land to provide a livelihood for all their children, clamour for schooling. They hope the children will qualify for white-collar jobs in the city.

It is a sad story of rising but frustrated expectations. Education that contains no training for the kind of work likely to be available causes great anguish. An ILO report to the government of Kenya summarises it like this: "Those who succeeded within the school system obtain the certificates and the good jobs... or did at first. But as education expanded rapidly, thousands of young Kenyans are beginning to find their certificates almost worthless for obtaining jobs. This is the background to frustration among school leavers and their families."

The complicating factor is that efforts to "ruralise" the school or to stress manual qualifications in the curriculum are no more than palliatives for they clash with an elitist scholastic system designed for other values or attainments. Moreover changes in educational systems take a generation or so to bring about, while manpower needs are immediate and short-range. From the point of view of direct benefit to employment, primary school seems to give the wrong education to the wrong age group.

Where else to turn?

The issue is dramatic. More than two-thirds of the people live in rural areas and their number is growing as population expands, despite increasing migration. Unless there are more opportunities for gainful employment in agriculture, and secondarily in crafts and rural industries, misery and social cleavage will deepen in the villages and the slums will devour the cities. The brunt of idleness, or of aspiration toward the "wrong" kind of employment, is borne by young people. To brand them "failures" is to destroy their ambition and to sap the strength

of the nation. Without the right kind of education for the right kind of attitudes and skills, the road ahead is dark and troubled.

Although the "right kind of education" will not by itself bring about the "right" society, education remains an essential component of socio-economic policies. Clearly something is needed between a useless formal system and simply leaving things as they are where people "learn by just living." As a recent ILO meeting of experts on workers' education in rural areas stressed, far more research, experimentation and forceful action is required to develop new approaches to non-formal, employment-oriented rural education.

What is needed is flexible educational resources which focus on the productive portion of the population (whether schooled or not) and may respond to manpower projections which only hold true for three years or so. Agriculture, far from offering longer employment perspectives, is subject to heavy fluctuations of markets and climatic conditions and may require the preparation of rural workers for new tasks in as little as a year or even a month. Education and training should be able to move in where the pressure is greatest and give the learner suitable education at the appropriate place and time. In short we need a mix between what might be called educational fire brigades and self-service opportunities.

Any hope that new institutions, such as vocational schools or rural polytechnics, will best match or complement on a massive scale the relatively well financed formal school system is unrealistic for they lack sufficient finance, teaching staff and facilities. Out-of-school education with an employment punch should rely on more readily available structures which may be expanded or re-focused with less effort and more hope of success: the field services of ministries of agriculture, health and social welfare, the various media of communication, and the organisations of rural workers and co-ope-

ratives.

One example can be seen in Senegal where the Administration for Rural Development (SODEVA), whose agents cannot regularly reach all the villages, and the Rural Educational Radio which backs field staff to organise receptions and feedback, have pooled their efforts not only to help peasants improve and diversify their farming but also to establish a frank forum for public dialogue between villagers and authorities. The voice of the peasants now can make sure they get the practical information and advice they need: What are the rights of a co-operator? How should the peasant prepare products for the market and assure that his bags are weighed correctly and he gets a fair price? Where can the village turn for assistance to dig a well?

Organisations of rural workers and co-operatives take initiatives to assure schooling for members' children (as in Malaysia and the Philippines), set up training programmes for their own staff, and demand the kind of education which improves the skills of farmers and helps them to defend their interests. Functional literacy programmes give support to such efforts. Literacy is needed to run organisations or co-operatives or to engage in operations required by modern commercialised agriculture.

Joint action by forces which are already influential in rural areas can create effective educational programmes with sufficient scope and flexibility to meet the vast and ever-changing rural employment needs. They can respond constructively to the problems faced by rural youth and adult farmers if they foster dialogue and inter-action with the villagers and keep attuned to their needs and aspirations. And they may in turn exert a refreshing influence on the formal educational system itself, influencing parents to accept schooling which leads to rural employment rather than to the cities, and providing new educational resources on which schools may draw to give a realistic focus to their efforts. □

DEMOCRACY

DEMANDS

DISCIPLINE

Law becomes more stringent to deal with

Food Adulteration

R.R. KHAN & S.N. Agarwal

PREVENTION OF FOOD Adulteration (Amendment) Act which came into force on 1 April, 1976 provides life imprisonment to food adulterators who are playing with the lives of people. Even more severe punishment has been assured by the Government if life-imprisonment does not help to curb this social menace.

Need for such a drastic step by the Government was felt only recently when shortages of essential commodities gave birth to the unholy trade of mixing unhygienic and poisonous substances with the items of mass consumption. Reports of mixing cow-dung with chilly powder and poisonous *kesari dal* with *arhar* started appearing every day. The glucose supplied to the hospitals by a pharmaceutical firm of Kanpur led to several deaths. A sample survey of some eatables conducted by Industrial Toxicology Research Centre, Lucknow in collaboration with the UP Government's Analyst Department revealed that almost 70 per cent of the samples were adulterated.

Social Pressure

The problem of food adulteration has in fact grown with civilization. Modern society with its large urban communities requires the provision of adequate food supplies to meet its growing demands. Ensuring their continued availability necessitates sufficient stock-building and arrangements to preserve food with minimum loss during transport and storage. Besides this, the dietary concepts of

the population are also changing. Manufacture of convenient and ready-made canned foods has revolutionised the whole concept of food production and technology. There is an increasing demand for diversification, improved quality, better appearance and taste of the available food products. To maintain the modern technological standard in food industry there has been a significant rise in the use of food additives. Today, the number of known food additives being used throughout the world well exceeds 20,000.

In India, 10 synthetic dyes, namely, amaranth, carmoisine, erythrosine, fast red E and ponceau 4 R (red), sunset yellow FCF (orange), tartrazine (yellow), indigo carmine (blue), green B and fast green FCF (green) are permitted as food additives for colouring foodstuffs. Besides, a number of non-permitted dyes like auramine (yellow), blue VRS, congo red, sudan II and III (red), malachite green, metanil yellow and orange II and rhodamine B are also available in the market. These non-permitted colours are comparatively cheaper and therefore they are extensively used as colouring agents and are quite dangerous for human health.

In order to ensure proper safeguards against the use of hazardous food additives, international agencies like World Health Organization (WHO) and Food and Agricultural Organisation (FAO) have studied this problem in detail. In the first meeting of the joint FAO/WHO Expert Committee on Food Additives the following principles have been adopted:

- (1) A food additive should be techno-

logically effective; (2) a food additive should be safe in use; (3) a food additive should not be used in any greater quantity than is necessary to achieve the technological effect; (4) a food additive should never be used with an intent to mislead the consumer as to the nature and quality of food; and (5) the use of non-nutrient food additives should be kept to the practicable minimum.

Legislation

Food laws attempting to protect the interests of consumers were perhaps among the earliest forms of legislation known to man. However, it was not until the last century that the basis for national food legislation as known today was established in industrialized western countries. By now most of the world's developed countries have fairly complex and sophisticated national food legislations.

In India, as early as 1937, Agricultural Produce (Trading and Marketing) Act (AGMARK) was imposed and standardised goods were produced under the scheme of quality control. The Act was amended in 1943. In 1947, with the establishment of the Indian Standard Institution (ISI) in New Delhi, the scheme of quality control could be geared up speedily especially with the provision of certification marks such as ISI, 'Agmark' and 'Q' to various goods according to quality standard. The Institution achieved some success in standardising articles sold in packings but unpacked commodities such as ghee, sugar, flour, salt, spices, pulses, rice, etc. continued to be adulterated. Several State Governments had adopted their own laws to maintain certain standards for food items. To maintain uniformity, the Union Government enacted the Prevention of Food Adulteration Act, 1954 which came into force on 1 June 1955. As a result of this enactment various laws adopted by State Governments stood repealed. Several amendments to the Central Act have since been introduced, latest being the 1976 amendment introduced in February this year. The salient features of 1954 Act as amended in 1976 are as follows.

1. Constitution of a Central committee for food standards to advise the Centre and State Governments on matters arising out of the administration of this Act (Sec. 3). The composition of the committee has also been laid down in the Act.
2. Provision of a Central Food Laboratory for analysis of

Shri Khan and Shri Agarwal are Scientists at the Industrial Toxicology Research Centre (CSIR), Lucknow.

food samples. (The laboratory has since been established at All India Institute of Hygiene and Public Health, Calcutta).

3. Appointment of persons as Public Analysts for the local areas by the Centre or State Governments.
4. Appointment of food inspectors by the Centre or State Governments for such local areas as may be assigned to them.

Under the Act the food inspector is empowered to collect samples of food articles from any person selling or delivering such articles to any other person (Sec. 10). A portion of the collected samples is to be sent to the public analyst of that area. The other portion is sent to a local health authority of the State. In order to avoid any deliberate delay on the part of Food Inspectors, provision has been made in the 1976 amendment to hand over the sample to the Public Analyst on the succeeding working day. The report of the public analyst has to be examined by a magistrate. In case the food is found adulterated, the magistrate may order the food to be forfeited by the authorities. The Act also empowers the consumer to get the food article analysed on payment. The local health authority shall on receipt of the adverse report from the public analyst proceed to prosecute the person found suspect. Provision has also been made to allow the convicted to appeal and get the sample re-analysed at the Central Food Laboratory. The report of the Central Food Laboratory shall supersede the report of the public analyst.

Penalties

The penalties prescribed in the Act have now been made more rigorous in the 1976 amendment. It prescribes that if any article of food or adulterant when consumed by any person is likely to cause his death or grievous bodily hurt, the person responsible for it shall be punishable with imprisonment for a term which shall extend from three years to life-term and with a minimum fine of Rs 5,000. This provision covers the actual adulterator, a vendor or distributor of adulterated articles of food. It may be mentioned that life-term punishment already exists in the State of Uttar Pradesh (UP Act 47 of 1975, Sec. 6).

The menace of food adulteration can be effectively curbed with greater sense of social responsibility exercised by the food industry and the law-enforcing machinery. The amended Act provides strict disciplinary

Yojana Quiz

1. The Government of India appointed a Planning Commission to prepare a blueprint of development taking an overall view of the needs and resources of the country in (a) August 1947 (b) March 1950 (c) January 1954
2. The only ape found in India is (a) Langur (b) Baboon (c) Hoolock.
3. On whose behalf was the National Flag presented to the nation in the midnight session of the Constituent Assembly on the 14 August 1947? (a) Members of the Constituent Assembly (b) Martyrs of this country (c) Women of India.
4. Which Five Year Plan sought to promote a pattern of development which would ultimately lead to the establishment of a socialistic society in India? (a) First Five Year Plan (b) Second Five Year Plan (c) Third Five Year Plan.
5. Din-i-Ilahi or Divine Faith was founded by (a) Khizir Khan (b) Akbar (c) Aurangzeb.
6. *Atharva Veda* was translated into Persian by (a) Haji Ibrahim Sarhindi (b) Abul Fazal (c) Naqib Khan.
7. Who received the Jawaharlal Nehru Award for International Understanding for 1970?
8. Who is "Punjab Mata"?
9. The Rs 56 crore fertilizer complex at Sancoale is in (a) Andhra Pradesh (b) West Bengal (c) Goa
10. India's second satellite communication earth station is at (a) Thumba (b) Sriharikota (c) Doiwala
11. Capital of Tripura State is (a) Udaipur (b) Agartala (c) Kailasahar
12. What does LASER stand for?
13. Since the enactment of the law abolishing bonded labour, the number of bonded labourers freed in various states is (a) 1,020 (b) 50,000 (c) 58,400
14. The scheme for the supply of essential commodities to students through cooperatives has benefited about (a) 762,000 students (b) 100,000 students, (c) 313,000 students
15. On which river are the following cities located (a) Hyderabad (b) Gauhati
16. In 1975-76 Hindustan Steel made a profit of (a) Rs 250 Million (b) Rs 10 million (c) There has been no profit.

ANSWER 1. (b) March, 1950 2. (c) Hoolock 3. (c) Women of India 4. (b) Second Five Year Plan 5. (b) Akbar 6. (a) Haji Ibrahim Sarhindi 7. Dr Kenneth Kaunda, President of Zambia 8. Smt. Vidya Wait, Mother of Martyr Bhagat Singh 9. (c) Goa near Vasco Da Gama 10. (c) Doiwala near Dehra Dun 11. (b) Agartala 12. Light Amplification by Stimulated Emission of Radiation 13. (c) 58,400 14. (a) 762,000 students 15. (a) The Musi, tributary of the Krishna (b) The Brahmaputra 16. (a) Rs 250 million

action against food inspectors and public analysts who are found to act in collusion with adulterators. What is required is a strong public opinion against the evil of adulteration and a social boycott of those indulging in this practice. Adequate facilities for standardisation, testing and analysis

of essential commodities in every State will help in the quick disposal of food samples. The analytical laboratories should be equipped with sophisticated instruments for qualitative and quantitative estimation of even minute quantities of adulterants. □

Managing Global Resources

CAROLYN KATARIA

COULD the world actually run out of some of its essential natural resources in the foreseeable future?

No, if the energy problem could be solved in time, says Dr Sterling Brubaker, a well-known American economist. He said, "So far increased scarcity has been more than offset by technical progress, and there is no reason to believe this won't continue in the future. Resources should not be viewed as a fixed stock, but rather as an expandable product of man's ingenuity and investment."

The real scarcity, according to him, is that of fossil fuels which are in limited supply. Since energy is crucial to successful management of most other resources, the need for a clean and inexhaustible source of energy is great. This would give immediate access to other material resources which are now not easily available because of shortage of energy or its high cost.

He said technology, such as fusion reactors or solar energy, can end reliance on fossil fuels, and some countries have the capital and know-how to make this a reality. "But, it takes time to develop and deploy new technology, so we must act with dispatch."

He further stated that conservation of resources can merely give us breathing time, not solve the problem. Conservation must go hand in hand with investment in research which can increase the supply.

"We are robbing future generations if we don't replace the capacity to have access to materials in the future that are equal to our own," Brubaker warns, and, as a remedy, advocates a tax on present resources to pay for the development of future technology.

Could an international organisa-

tion solve global resource problems by reallocation?

In Brubaker's opinion this is not a feasible solution. "After all," he points out, "there really aren't any global resources—only national ones. And as long as nations are truly sovereign, they will not readily give up control over their own resources. What's more, there are too many chauvinistic interests at stake for such an organisation to be workable."

He further thinks that rationing would "repress increased output because producers would no longer be selling to the most lucrative markets." As with any other product, he says, there must be incentives to produce.

At the present time, access to raw materials is governed by the open market. Dissatisfaction with this system is mainly expressed by the lesser developed countries (LDCs) which feel they are not getting their fair share of the world's income.

But Brubaker believes that redistributing the world's resources is no panacea either. He says, "The LDCs are limited in their access to raw materials because they don't have the financial resources to purchase on the open market. What they really need, then, are not just natural resources, but total economic resources, and this problem must be solved on an economic level—by direct transfers of wealth, through aid, loans or private investment."

In Dr. Brubaker's view, raising commodity prices suddenly and unreasonably distorts the economic systems, which, in turn, leads to inefficiencies. Furthermore, it increases inequality because some countries are sellers of raw materials while others are not; also, all products are not amenable to price manipulations.

He argued that if it is not feasible to control resource allocations, then

the stress should be on cooperation. In support, he cited the major U.S. proposals made by Secretary of State Henry Kissinger at last year's special session of the U.N. General Assembly on raw materials and development.

Emphasizing the theme of cooperation and interdependence, Kissinger called upon all nations, developed and developing alike, to pursue their national interests by contributing to the global interest.

He proposed a five-point programme for international actions to promote economic development. One of the key proposals aims at improving the LDCs' access to world capital markets as well as to new technology.

Other proposals seek to:

- Foster international cooperation to ensure basic economic security by avoiding economic shocks to the LDCs, such as sharp declines in their export earnings, food shortages and natural disasters;

- Improve basic opportunities of the developing countries in the world trading system so they can make their way by earnings instead of aid;

- Provide conditions of trade and investment in key commodities on which economies of many developing countries are dependent, setting an example in improving the production and availability of food;

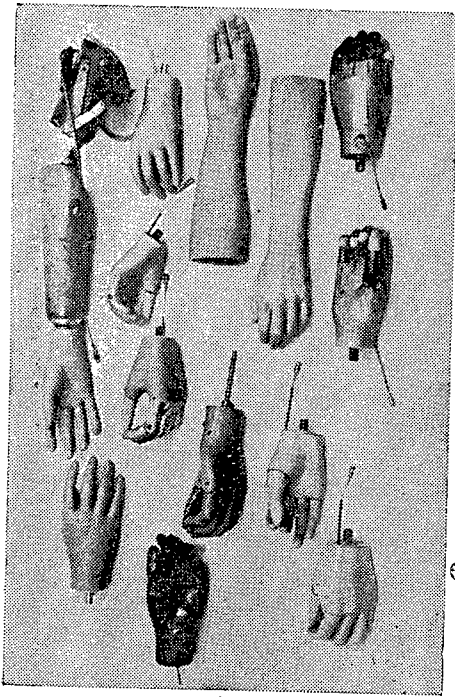
- Address special needs of the poorest countries, who are most affected by the current economic crisis, sharing the responsibility among old and newly wealthy donors.

In addition, the United States has pledged support for the new United Nations Revolving Fund for National Resources. This fund, in Kissinger's words, "will encourage the worldwide exploration and exploitation of minerals, and thus promote one of the most promising endeavours of economic development."

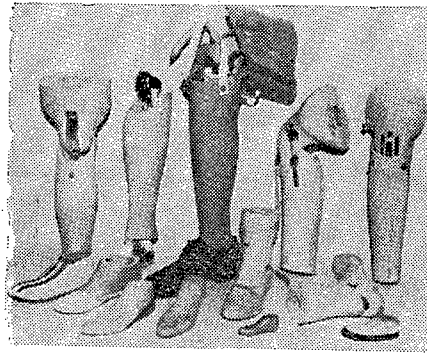
In Dr. Brubaker's view, organisations such as this, which stress research and development, are for preferable to ones which could only allocate shortages.

Summing up, he said, "If technology is our ultimate resource, then exchange of technology and encouragement of capital transfers might do more to equalize income than any conceivable resource allocation scheme. But no matter what new economic order evolves, it must recognize the needs of individual sovereign states, in an increasingly interdependent world."

(Courtesy: USIS)



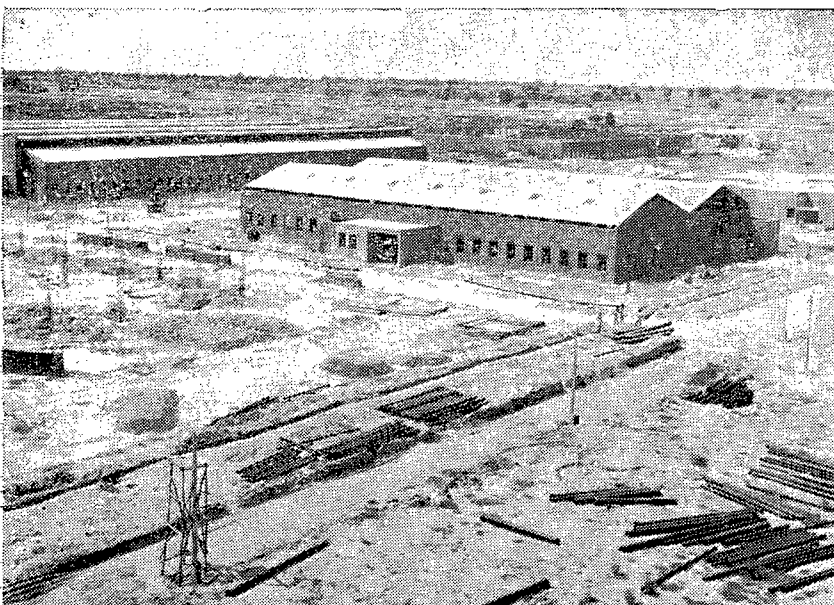
MANMADE LIMBS



**to work
and walk
once again**

Physical disability is the outcome of gruesome disasters like war, accident, disease, old age etc. The growing pace of mechanisation, not only in the factories but also in the agricultural farms and even at homes, has added 'greater risks to human life and limbs. As a result, the number of handicapped persons which stands at about 20 million is increasing every year. Out of this, nearly 2 to 3 millions are amputees. And approximately one lakh amputees join them every year,

**SAYS
MAJOR GENERAL K. RAGHUNATH**



ALIMCO factory at Kanpur which is nearing completion

TO BE SUDDENLY without limbs is not only physically painful, but also a major shock. Expressing sympathies to an amputee and probably offering charity is a time-honoured approach to the problem. However, they do not want pity or charity. What they want is a compassionate understanding and be put on a gainful productive job on which they can rehabilitate themselves and be on their feet, and also, at the same time, find their rightful place in society and contribute their mite towards uplifting the economy of the state.

It is a well known fact that whenever person had been dealt with in a compassionate manner and entrusted with a job, he has invariably applied himself to the job in a diligent and keen manner to produce results not reached even by able-bodied ones. So, the traditional Indian spirit of pity and charity towards a disabled person must now change to compassion and a more constructive approach.

Prior to independence, Artificial

Major General Raghunath is Managing Director, ALIMCO.

Limbs were either imported or fashioned by the local craftsmen or artisans under the direction of surgeons, both having little knowledge of the bio-mechanics. It was only in 1948 that the first Artificial Limb Fitting Centre was set up at Poona by the Indian Army. Today there are eleven centres which fit artificial

limbs and manufacture them on a small scale without any standardisation. Consequently a wide gap between demand and supply existed.

The government of India was already alive to the problem. But this problem was accentuated in 1962, when the disabled military and paramilitary personnel had to wait for

a long time to obtain artificial limbs. The situation worsened in 1965 and more so in 1971 during the wars with Pakistan.

In 1963 a team of experts from World Health Organisation made a detailed study of the country's requirements of rehabilitation aids, prosthetic and orthotic appliances. They recommended the setting up of an artificial limbs manufacturing unit at Kanpur.

The Artificial Limbs Manufacturing Corporation of India (ALIMCO) besides manufacturing the required material would also be setting up 34 limb fitting centres during the 5th Five Year Plan (1975-79) in collaboration with the State Governments. These centres would provide rehabilitation, prosthetic and orthotic fitting facilities to the disabled persons.

ALIMCO has finalised a scheme for providing a minimum of **one** limb fitting centre in each State and has set up a separate department of limb fitting services. ALIMCO expects to set up 6 Regional Limb Fitting Centres at Jaipur, Madras, Nagpur, Calcutta, Trivandrum and Cuttack besides 28 Peripheral Limb Fitting Centres at various other places. ALIMCO would provide Rs. 25.2 million as grant-in-aid with corresponding grant from the State Government. The majority of these centres are expected to be fully operative by 1977-78.

It has also been decided to set up a Central institute of Prosthetic and Orthotic training at Cuttack. This Institute will impart training to orthotic and prosthetic technicians and engineers. It is hoped that ultimately this Institute would prove a boon to train **Prosthetic and orthotic Technicians and Engineers**.

The construction work at the ALIMCO plant is in full swing and the plant is to start production in the current year. It is being financed from the National Defence Fund. It will produce battery-operated wheel chairs and sophisticated items like hydraulic, pneumatic knee joints.

When in full production in 1978-79 ALIMCO is expected to have one lakh components worth Rs. 50 million a year. The basic equipment, raw materials, requirements of engineering and technology of production etc., are being met from indigenous sources. There is no foreign technical collaboration.

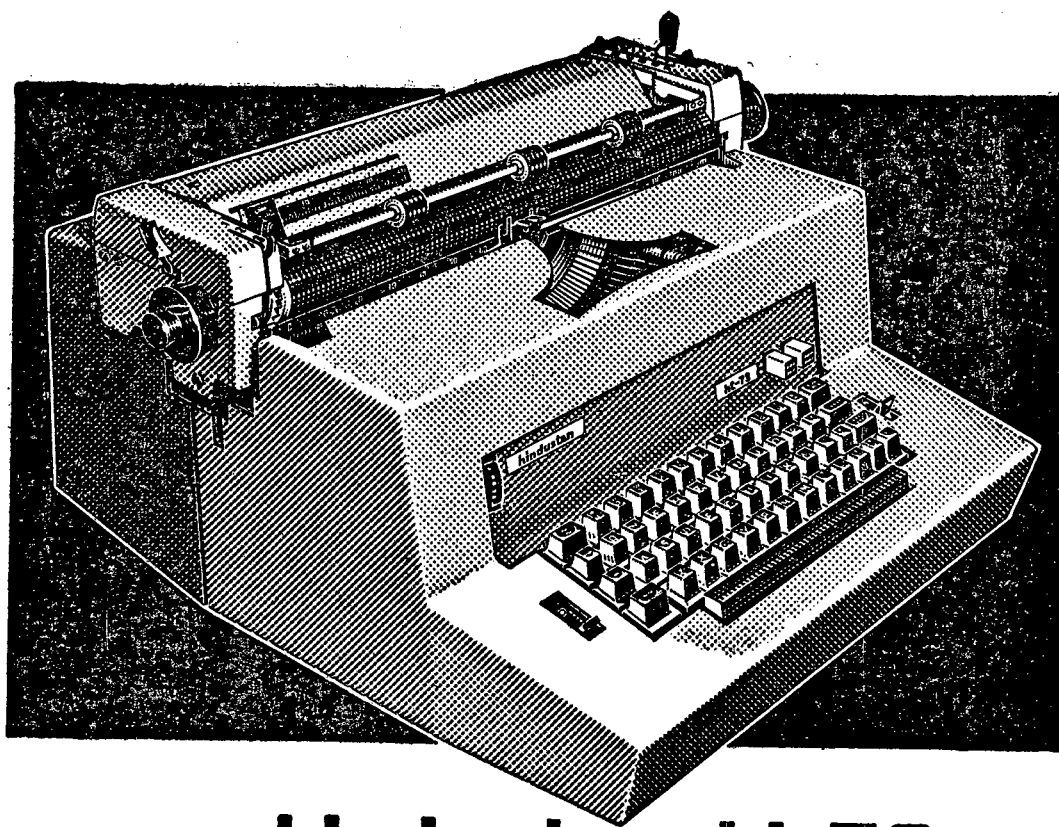
ALIMCO would employ 1200 personnel, when fully operative, half of whom would be war disabled servicemen, war widows, disabled paramilitary personnel and disabled civilians. □



Top and Bottom: Artificial limbs make the two disabled youngmen stand on their feet again



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Looking Ahead to the World Employment Conference . . .

Living With Less Work

BY PIERRE GASCAR

The present economic crisis in Western countries hides the real nature and true causes of one of the most drastic changes to occur in the human condition for thousands of years. Demographic evolution and technological progress are responsible for an increasing number of people finding themselves exempt from the commandment to work.

BOTH THE THEORY that *homo sapiens* (or man the thinker) is subordinate to *homo faber* (or man the doer) and the philosophical claim that "to be is to do" have their roots in man's earliest history, as is evidenced by paleontological discoveries. Indeed, man has been a worker from the beginning of his evolution. But that work should thus have been linked to the very genesis of our being is still not enough to explain why to this day we try to find in work a confirmation of our own existence. We have many other looking glasses. But the advantage of the mirror of work is that it reflects us as social beings, fulfilling us, enlarging us and rehabilitating us in our own eyes. Our whole culture tells us that solitude is sinful and that work, even though it benefits no one else, is like language—it represents a bond between human beings.

Even in the most revolutionary ideologies, the benefits of work are not limited to what it produces, to the material improvements which it affords. Work is bound up with the idea of unlimited progress and this makes it the best part of human destiny. By praising the nobility of work, we demonstrate the blasphemy of oppressive economic systems under which workers are compelled to slave

in intolerable conditions.

From philosophy to religion, from Greek myth to original sin, from middle class morality to humanitarianism, everything throughout our history has contributed to the sanctification of work. Although mechanization today often reduces work to an impersonal and monotonous task, in our conception of existence it occupies a place of importance unjustified by its economic function. Consequently, the decline in the amount of work done by people in industrialized countries is forcing our civilization into a new era, both because it involves a total reorganization of society, and because it compels us to reconsider one of the fundamental principles upon which our life up to now has been based. It means giving a status to the unemployed man, the representative of a new class which is bound to grow in the course of the coming years.

We do not look at unemployment as a social condition. We live it as an individual experience, even when it is the common fate of millions of individuals. To escape this waiting period, this cruelly inflicted void, everyone counts more on his own luck than on any general social measures. Unemployment isolates while work unites. It is an element of disorder, but, politically, it can lead to extremes and to blindly irrational choices

(it was partly unemployment which brought Hitler to power in Germany).

It is therefore only natural that since our societies are unable to eliminate unemployment, they should at least disguise it. Reducing working hours and lowering the retirement age are only camouflages to pass off unemployment as leisure time or a well-earned rest. This artificial social transfer, which, of course, merely shifts welfare subsidies from one section of society's accounts to another, nevertheless has a definite psychological effect. However, it seems that if the change we are undergoing is to be weathered without too much damage, it must be accompanied by a real change in our way of thinking.

Apart from the dynamics of its productive activity, work provides the community with moral dynamics, the weakening of which could have effects in the least expected places. Ambition, or as it is popularly referred to now, competition, the desire for advancement, either for the material advantages or for the personal satisfaction it brings, or simply the struggle for higher wages and better working conditions not to mention the political activity usually connected with these demands—all these things keep the collective consciousness on the alert, ready to grasp whatever is offered, even outside the area in which it normally operates.

If any would
not work, neither
should he eat

—THESSALONIANS

In our societies, work offers the only real existence to a person—"to be is to work"—not only because people participate in production, but also because they are always trying to improve their conditions or to escape from them by one means or another (if only through early retirement), and because these desires, these preoccupations, this tension and stimulation are, in the full sense of the expression, "active life".

Nothing very constructive can be expected from people who are wholly unoccupied (at least not for the moment, since we are in a period of transition). Because early retirement has "liberated" a large number of people still in full possession of all their mental and physical faculties, it might have been expected that political, religious, cultural and other groups would have acquired many members with time on their hands

Work banishes three great evils : Boredom, Vice and Poverty

—VOLTAIRE

and an interest in volunteering their services. But it seems as if work was a composite whole and must be prompted by necessity.

Perhaps it is significant that country life attracts people who are temporarily or permanently out of work. Undoubtedly, they are responding mainly to the physical and moral need to flee the hell of the modern city, but they are probably also unconsciously seeking a world where a person can feel fully alive without having to make an effort. The conditioning to which our minds have been subjected over thousands of years by the commandment to work will surely disappear as we rediscover man's rightful place in nature, which he occupies without having to justify himself in the least.

In the developing countries, the modernization of existing industries and the mechanization of agriculture, thanks to imported equipment and technicians, upset the employment situation, in addition to causing other economic problems. Most often, industry, which might absorb those agricultural workers freed, so to speak, by the introduction of machines into agriculture, is not developing fast enough to absorb all these workers. Furthermore, industrial growth can only come about through the use of highly automated production equipment which reduces human participation to a minimum.

Both in order to limit the amount

of unemployment caused by the modernization of agriculture and to reduce the cost of importing advanced machinery and equipment, some developing countries have turned to appropriate technology, which involves increasing the number of stages in the process of advancement, and pausing between stages. This means that these developing countries should take their designation as "developing" literally and travel the road to technical development which was followed earlier by today's industrialized societies, without taking any short-cuts, at least for the moment. The aim is to use various procedures which were improvised or applied at other times in other countries in order to increase production and reduce the burden of human effort without, however, eliminating the need for a human contribution. The introduction of the manage a semi-mechanized system using animal power, is one of the best examples of really appropriate technology.

Obviously, those who are urged to use appropriate technology may well see it as "poor man's modernization", and this will inevitably add to the legitimate bitterness they already feel in this unjust world of ours. Moreover, these intermediary forms of progress in a sense compel these people to re-enact the history of one or another foreign civilization, and to follow a pattern of development which is not necessarily their own. Modern technology and sophisticated machines do not bear the stamp of any particular civilization (nothing distinguishes a Chinese computer from an American one), but everything that smacks of handicraft is the expression of a specific culture and can only be artificially grafted onto another. Finally, progress in its most advanced forms belongs morally to all mankind, and to give certain countries the hand-me-downs of our past while they make up for their technological tardiness runs counter to the laws of evolution.

What is true for tools is also true for human skills. The renewed appreciation—you could even say rehabilitation—of manual work in industrialized countries is related to the introduction of appropriate technology in some developing countries in that both are imposed by economic and social necessities. This revaluation is destined to reduce unemployment by gradually expelling immigrant workers, formerly the only applicants for manual labourers' jobs, and also by providing the public with an increased supply of repairmen, mechanics and general handy-men. But a certain confusion of

ideas is evident. Although an attempt is being made to persuade more people to take up jobs requiring physical effort by offering them various benefits, there is, of course, no question of continuing to demand physical effort where mechanization could eliminate the need for it.

Since no country at present, whatever its degree of development, can support the permanent non-employment of a large part of its population, it is only natural that some confusion should be apparent among those whose job it is to plan our future. In addition to their purely material concerns, they show a vague and sometimes even unconscious anxiety to preserve, at least in principle, a way of life as old as man. Each one of us, too, would like work to be organized in such a way that it would be more human; would allow adequate time for leisure, would be better paid, but most important, that it would be shared as widely as possible among all those whose age entitles them to an active life.

Man's vocation for work is still a fundamental element in our conception of existence. Since the beginning of time, man has pitted his pride and joy as a creator against this commandment to work. He has made a virtue of the necessity to work. In

Blessed is he who has found his work; let him ask no other blessedness

—THOMAS CARLYLE

our dream of the ideal society, moreover, work is the real gauge of merit and the degree of its usefulness is the major criterion in the distribution of society's wealth. Thus, we are faced with an urgent question: What will be the basis for the organization and, more particularly, the moral order of society in a world where work is no longer the most important element in the human condition?"□

(Courtesy: Development Forum)

Resources From The Oceans

S. Z. QASIM

IF A MAN LOOKS at the Earth from space for the first time, he would probably name it the water planet. His view of the earth's surface would be largely obscured by the clouds of water vapour, and through the gaps between these clouds, he would be able to catch glimpses of immense bodies of water and some scattered masses of land. These large bodies of saline water from the seven seas include the five major oceans namely the Atlantic, Pacific, Indian Arctic and the Antarctic and a number of marginal seas.

Oceans form the life-line of the earth. They regulate the earth's climate. They have inexhaustible sources of energy. They contain immense mineral resources. They have vast stores of plants and animals, which can be effectively used as food for the growing population on earth. Thus for utilizing the resources of the oceans new technologies have to be developed from time to time.

Oceanography is the scientific study of the oceans, with their contents and boundaries. It is a composite science in which scientists from different disciplines are drawn to work on the physical, chemical, geological, biological and engineering aspects of the ocean. Thus the science of oceanography comprises the scientific disciplines of physical, chemical, geological and biological oceanography. Maritime meteorology and coastal oceanography are offshoots of these disciplines. Besides these, the application of engineering methods in the sea has recently given rise to a discipline called ocean engineering and technology. Oceanography studies in India made a beginning in 1962 under the International Indian Ocean Expedition and some useful data were collected during the period 1962 to 1965.

The work of the National Institute of Oceanography is carried out by five divisions at the headquarters and two Regional Centres at Cochin and Bombay. During the last few years the objectives of the Institute have

been revised with the main emphasis on using the sea for the benefit of common man.

During the last 10 years, the physical oceanographers of the Institute have developed considerable competence in undertaking problems on ocean-atmosphere interaction, land-sea interaction and nearshore circulation with their application to coastal zone management. Studies carried out by the divisions so far have given a better insight into the problems of coastal erosion, siltation harbours and sandbar formation at river mouths. They are also working on a device called 'Wave energy oscillator' which will be used for the generation of energy from waves.

The geological oceanographers have conducted excellent studies on the distribution of different types of sediments in the shelf regions of the east and west coasts of India with a view to locating areas of economically important mineral deposits. Bathymetric, magnetic and bottom sampling surveys are being carried out in the continental shelf areas, and promising areas for more intensive investigations on mineral deposits have been identified.

The biological oceanographers are studying the living resources in relation to environment problems. They are conducting detailed studies on the fertility of the ocean, productivity of waters, location of promising sites for sea farming and the development of aquaculture techniques. Sea farming for mussels, oysters, shrimps and several varieties of seaweeds in the coastal waters of Goa, Cochin and Bombay have yielded very promising results.

The Regional Centre of NIO, in Cochin has done some pioneering work on zooplankton of the Indian Ocean and has produced a number of excellent plankton atlases, which are much in demand throughout the world. The Centre is internationally acclaimed as a specialised school on tropical zooplankton.

The chemical oceanographers are dealing with the chemistry of sea water and sediments with an ultimate application to the exploitation of raw materials from the sea for varied industrial applications. Last year, a new programme has been initiated to explore the possibilities of obtaining drugs from the marine flora and fauna.

In the field of oceanographic instrumentation the scientists have organised a well-equipped workshop and laboratory and are concentrating on fabrication of all essential oceanographic equipment.

A number of electronic instruments like the tide and wave recorder and *in situ* temperature and salinity meter, depth recorder and telemetry system have been developed by the Division.

One of the major areas of work in the Institute is the protection of marine environment from pollution. In this project physical oceanographers, chemists and biologists are all involved, and during the last two years, the Institute has undertaken a number of sponsored projects from the industries and has given consultancy and advice to many agencies towards the control of pollution.

The scientists of Planning and Data Division are mainly engaged in the acquisition, processing, retrieval and dissemination of oceanographic data. Publication and information work of the Institute is also being undertaken by this Division.

One of the most important achievements of ours in the field of oceanography has been the development of an expertise or the capability of doing a particular type of job ourselves in the ocean. Ten years ago this type of capability was non-existent in the country. For example, the projects on harbour development, submarine pipeline surveys, underwater cable surveys and development of offshore structures were undertaken in India entirely by foreign companies. Most of these are now done in India.

The capabilities of the Institute have increased considerably by the commissioning of India's first research vessel GAVESHANI on 31st December, 1975. Built and refitted at the Garden Reach Workshops, Calcutta, this vessel is 68 metres long, 12 metres broad and has a 3.5 m draft and 2,000 tonnes D. Wt. The average speed of the vessel is 10 knots with 15-20 days endurance capacity and can accommodate 19 scientists. The vessel is fully stabilized and airconditioned. There are 5 laboratories on board the vessel, including one wet laboratory. She has recently left for Bombay High for the 160 kilometre sub marine pipeline survey.

Major changes are expected in the field of production and harvest of food materials, mineral exploitation including oil and fresh water from the sea, utilization of tides, waves and thermal variations for energy production, and in the development of harbours, ports and oil terminals. □

(Courtesy: AIR)

ATTILI, a village situated in Tenuku Taluk of West Godavari has a long history and ancient pedigree. According to the legend of the land it was the hermitage of the Vedic Sage Atri. It is on the Nidadavavolu—Narsapur Branch Railway line and by road it is 18 km from Tedepalligudem.

The Grama Panchayat was constituted about half a century ago in 1918. It is having an Executive Officer since 1944. Its area is about 13 sq. km and the population is nearly 15,000 out of which about 1300 are Harijans and Girijans. Out of fifteen members in the Panchayat two are women and one is Harijan.

It has premises of its own constructed at a cost of Rs. 32,000. Present annual income is Rs. 2,56,500 of which 25 per cent goes towards establishment consisting of an Executive Officer, 3 Clerks, 3 Bill collectors, a Peon, and 36 staff members to look after sanitation, lighting etc. There are three permanent cinema theatres fetching entertainment tax of Rs. 90,000 annually. Tax on market stalls, surcharge on stamp duty and land cess account for the rest of the income.

Income of the Panchayat increased by 86 per cent during the last five years on account of the K. Samudrapugattu Production Scheme. Besides tax collection by the Panchayat during the last decade and a half has been 100 per cent. For supplying drinking water there are three tanks, 22 public wells and a number of private



The Panchayat Samiti Elementary School.

ATTILI HAS AN IDEAL PANCHAYAT

B. ATCHIAH

Shri Atchiah is Distt. Public Relations Officer, West Godavari, Andhra Pradesh.



A fascinating view of the Badeti Venkatramaiah Naidu Park, Attili.

wells. The Panchayat is contemplating to supply protected water at an estimated cost of Rs. 4.8 lakh. Roads are laid in all the streets and they are well maintained. There is private scavenging system. Compost is manufactured in a separate yard with rubbish and night soil. Community compost pits are provided on nominal hire basis.

The Panchayat is taking preventive measures like vaccination, inoculation, chlorination of drinking water etc. Births and deaths are registered regularly and correctly. Pucca burial ground with a shed is provided. There is daily and weekly market. Eight stalls have been constructed in the bus stand at an estimated cost of Rs. 80,000. There is also a pucca bus stand with a passenger shed constructed by the Panchayat at a cost of Rs. 45,000. R.T.C. buses from Bhimavaram to Tanuku and from Narsapur to Tadepalligudem and Tadepalligudem to Koderu ply via Attili.

Kesi Sager Production Scheme was implemented in 1972-73 at an estimated cost of Rs. 165 million. With the Grama Panchayat investing Rs. 15,000 out of the income of Rs. 1 million the Grama Panchayat is getting 3/5 of the investment. Out of the total Ayacut of 3500 acres 881 acres of land was cultivated during Rabi of 1974-75 with high yielding varieties in addition to sugarcane and others crops. There is a seed store and agricultural implements are supplied on hire basis.

Educational facilities are adequate with a Degree College, a Junior



The Artificial Insemination Centre which caters to the livestock of the area

College, two High Schools and nine elementary schools two of which being located in Harijanwada. The contribution of the people and the Panchayat came to Rs.263 million for these institutions. There is a veterinary dispensary and an artificial insemination centre owning pucca building costing Rs. 30,000 out of

which people and the Panchayat contributed Rs. 12,000 and Rs. 4,000 respectively.

There is also a Panchayat Samithi dispensary with one M.B.B.S. Doctor and other staff. There is a proposal to improve it with the aid of Red Cross. 698 tubectomy and vasectomy operations have been

conducted.

The Cooperative Society here has a membership of 560 with a share capital of Rs. 1,40,000. There are cooperative societies for washermen, barbers and cycle rickshaw pullers with a membership of 69,33 and 54 respectively and got loans sanctioned to the tune of Rs. 53,550, Rs. 11,050 and Rs. 52,000 respectively. She-buffaloes and milk cans were supplied to 33 Harijans on loan basis. 230 Harijans also got agricultural loans. A tank has been provided for Rajakas at a cost of Rs. 30,000, 36 houses were constructed for Harijans on a site of 5 per cent each at a total cost of Rs. 65,000. Sanction has been obtained for construction of a Hostel for Harijan girls at a cost of Rs 75,000. Mahila Mandali has a pucca premises costing Rs. 25,000 towards which people and the Panchayat contributed, Rs. 5,000 each respectively. One Harijan is on the Trust Board of the local temple. Steps are also being taken to have a Market building and Library at a cost of Rs. 65,000 and Rs. 30,000 respectively. As such it is not surprising that it has been adjudged as the best Gram Panchayat at National level. □

THE LIANHRANGA Aluminium industries, Aizawl the first of its kind in Mizoram was registered with Industries Department in February, 1975 and was inaugurated on 8 August 1975. The proprietor Shri Lianhranga came from a village and settled down at Aizawl in the year 1970.

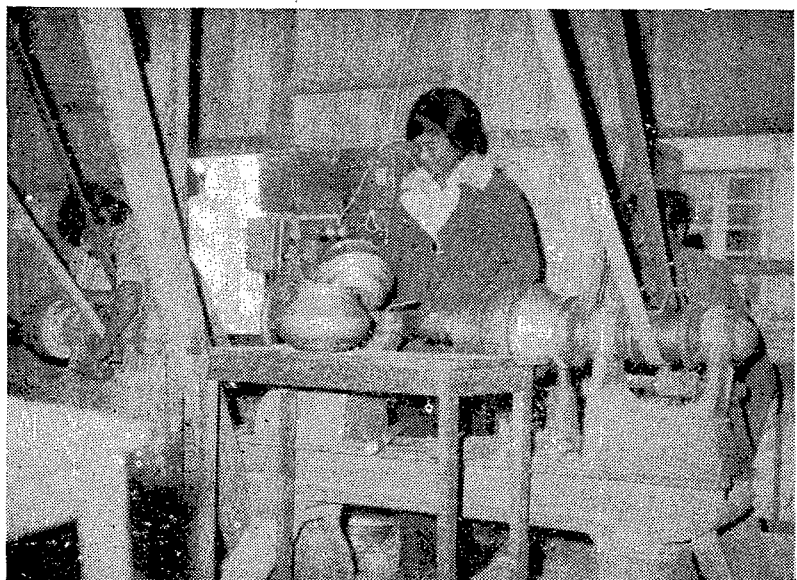
The Lianhranga Aluminium Industries at present has four spinning machines and one polishing machine costing about Rs. 70,000 with a capacity of producing 200-300 kgs. of finished pots and basins of different sizes daily. The proprietor expects to be able to produce varieties of utensils including kettles, filter, degchi etc. to meet the requirements of Mizoram in the near future. They now employ six skilled spinners and six casual labourers at a total salary of Rs. 3,000 per month.

The wholesale rate of the product now is Rs. 21.50 per kg. and the special quality is sold at Rs. 28.50 per kg. Materials like Aluminium Circle, soda and acid were purchased mainly from Calcutta. The project has been set up with an accent on self-employment.

R. Sangthuma

A Success Story

Lianhranga Aluminium Industry



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The dialogue required to reorganise the economy can only be achieved from positions of strength.

READING THE resolutions approved by the General Assembly of the United Nations at the end of the Seventh Special Session in September 1975, might be disappointing and might even have discouraged many supporters of the new international economic order, mostly those who had dedicated themselves to the difficult task of preparing detailed plans for the replacement of the present order. As a result of many arduous compromises the text of these resolutions appears very often ambiguous and even inconsistent. It sounds more like a declaration of good intentions than a programme of action. No operational measure is foreseen. The delicate task of working out concrete proposals for some of the most serious problems has been entrusted to UNCTAD or to its Secretary-General. Other problems are still waiting for capable and competent consideration. The list of complaints could grow longer and longer.

However, I do not share this feeling of disappointment, mainly because I did not consider this Special Session as a kind of "constituent" meeting to adopt a fundamental bill for the changeover from one order, which was established during the course of several centuries, to a better one. This new order is of course desired by the majority of mankind, but its outlines are still undefined; and they can only be defined through a series of confrontations and negotiations with the help, among other things, of an intense intellectual effort that all men of good will should make to ensure the survival, progress and well-being of mankind. Not that I do not believe in the usefulness of the United Nations. On the contrary, I am among those who believe in the objective reality of an international community and in the necessity of providing it with adequate organisations.

Ismail-Sabri Abdalla is the Director of the Institute of National Planning in Cairo.

From Confrontation To Negotiations

ISMAIL-SABRI ABDALLA

The industrialised countries, which conceived the United Nations as an instrument for administering international affairs, might be tempted to withdraw from an organisation of which they risk losing control. But we of the Third World request a restructuring of international institutions to make them more representative, efficient and democratic. This restructuring will no doubt be one of the main elements of the new world order, and not just a prelude to its establishment.

Other side of the coin

If I consider as positive the work carried out by the Seventh Special Session, it is because I see it as a step forward in the historical process that has already started, although its final goal—the establishment of a new economic order—will take many years. The concept should not be limited to relations between "developed" and "developing" countries. These relations definitely influence the local economic situation of the nations concerned, but first and foremost, they reflect these situations. Any radical change in the foreign economic relations of a country or a group of countries inevitably implies an equivalent conformity in domestic economic policy. Production precedes trade and it takes place within the countries' framework. Under these conditions, changing the world order means a revision of the strategies and policies followed up to now by the three groups in which the world of today is divided: capitalist countries, developed socialist countries

and the Third World.

For the Third World, the stakes go well beyond the granting of 0.2 or 0.3 per cent of the GNP of the rich countries as supplementary assistance or even of better trade terms or a greater influence in the reform of the shaky monetary system, etc. All the projects of resolution submitted by the group of 77 to the Seventh Special Session are only immediate claims inserted in a much larger perspective, that of economic decolonization. How many times have the nations that obtained political independence thought they had come out of the tunnel in the solemn moment when they lowered the foreign flag and replaced it with their national colours? Two decades of development have disillusioned them. They discovered that the physical fight against foreign troops, whatever the bloodshed was easier than the fight for economic independence against the multiform and sometimes non-physical presence of the multinationals, which distort their development and encourage them to integrate into the world capitalist system in a position of growing subordination, without reducing the distance between rich and poor either on the national or the international level. These are things of which the people of the Third World today are no longer unaware.

First of all, the fact is that our underdevelopment is nothing but the other result, the other side of the coin, of the process of the development of world capitalism itself. Without using extreme expressions (such as plunder, etc.) this kind of development was simply inconceivable without the free access of a small group of countries to the natural resources of the world and to these markets without the massive transfer of all kinds of wealth from the periphery toward the centre, without the free circulation of capital and men where profit required it (even to the extent that men were forced to transfer in the name of freedom: black trade).

Intellectual dependence

In the second place, we are more and more aware of another reality; the market mechanisms always function to the detriment of our interests. In the abstract model of perfect competition, all marginal producers are bound to disappear. This was even boasted about by the supporters of *laissez-faire* as a guarantee of efficiency through the survival of the fittest. Now the countries of the Third World are, generally speaking, among

the least fit. Furthermore, the capitalist structure is now far from the original model and for many decades has been based on monopoly or oligopoly. The characteristics of "imperfect competition" have been outlined theoretically since the 1930s when Keynes denounced the under-employment equilibrium and asked for public action to ensure the full exploitation of resources. Public authorities in the most advanced capitalist countries have already adopted the measures they believe necessary for the survival of their society, without worrying too much about the market mythology. But with the Third World, they continue to enforce the sacred laws of the market. This is the origin of the present institutional crisis of international economy. If international trade is to develop harmoniously and progressively rid itself of its exploitive character, the international community must be able to end the worst abuses of the world markets . . . while waiting for international planning.

Thirdly, the Third World is becoming increasingly aware that the type of development imposed on it is neither realistic nor desirable. It is the worst type of dependence; intellectual dependence. We have accepted the historical pattern of the West as unique, we have identified progress with the European-American way of life. From this viewpoint, development is considered only as a simple historical delay which can be made up for with the help of course of those who preceded us and hold the keys to the mystery; capital and technology. The concept of economic stages of growth has even infiltrated the spirit of those criticizing Rostow. Everybody speaks of economic take-off as the decisive stages of this race toward growth. After thirty years of efforts and illusions, we can state that nobody has really taken off. Even the few countries considered the "middle class" of the Third World find themselves out of breath, not to mention the social cost of undernourishment, illness, illiteracy, repression, political instability, etc. I believe it is the duty of all honest and conscientious intellectuals to cry out loud that the average citizen of the Third World will never know the present level of affluence of the average American. Such a level is not only the consequence of the work carried out by American society but also the historical result of the exploitation of the whole of mankind. Furthermore, it implies such a waste of unrenowable resources that

it cannot be guaranteed to all.

Not merely cyclical

Finally, it is not sure whether this unrestrained consumption has helped man to blossom, to find happiness. On the other hand, the Western model destroys the physical and cultural environment. Our societies, often endowed with a remarkable cultural heritage, must find a way to become modern without losing their personality; they must also seek a direct remedy for the destitution of the masses, without however systematically destroying social structures in which the individual is not forced to follow a solitary road to success and without, above all, the creation or reinforcement of a privileged class.

From all the above, it is possible to understand the deep meaning of the Third World's present action: the struggle for economic decolonization; and it is easy to imagine the powerful interests against which it has to fight. But the balance of power now favours the destitute majority. The First World and the Second World are facing problems, even crises, which they will be able to overcome only within the framework of a new international cooperation. The present recession in the capitalist countries is not merely cyclical, it is characterized by "stagflation," for which the Keynes therapy is useless. Several economists have studied its structural aspects. What seems certain to me is that it is no longer impossible to foresee a recovery based on an unlimited supply of energy and raw materials at low prices. This fact above all calls for an overall revision of the expansion policies; a revision that is also encouraged by the need to protect the environment and improve the quality of life.

On its side, the developed socialist world COMECON must face the consequences of its insertion into world economy and of the changeover from a relative economic self-sufficiency to a position where domestic growth will depend mainly on trade with the countries that are not members of COMECON and especially with the capitalist countries, at the time of the detente. On the other hand, with the improvement of their standard of living these countries will have to avoid the negative aspects of a consumer society. It is therefore clearly a process of recasting world economy. The Third World does not want this to be done without its participation or to its disfavour. Europe and America have

been too long accustomed to identify the international community with their own borders. This also is no longer possible; the colonies of yesterday are today nations with full citizenship rights. The destitute of this world, after all, are citizens of these nations and they want to enjoy their rights in full.

In international fora, it is fashionable to preach negotiation rather than confrontation, but it is only a diplomatic policy. No one is so naive as to believe that world order can be changed by sermons only. To begin with, there is a conflict of interests, therefore the seed of confrontation is there. But just as cohabitation on the same planet is a reality and self-sufficiency, apart from a few rare exceptions, a dream, we try to solve conflicts through negotiation instead of using gunboat diplomacy or economic strangling. It is natural that, before starting negotiations, each party should try to strengthen its own position to persuade or dissuade more effectively.

The laws of the strongest

But why insist on an analysis of conflicting situations and bargaining positions—subjects on which many books have already been written—when recent events have shown our viewpoint eloquently enough? If there is so much talk about a new international economic order and if the industrial countries have made some concessions and have accepted to negotiate, it is the consequence *inter alia* of two facts, which have brought about a turning point in the history of North-South relations. First of all there is the OPEC decision. In my opinion the real meaning of this act is not the increase in prices, which the industrial countries have camouflaged under the huge wave of world inflation. It is not what has been called a transfer of wealth because petrodollars are, as everybody knows recycled. But there is the beginning of a transfer of economic power. In fact, for the first time in modern history, a decision affecting world economy as a whole was taken by the Third World countries, and not by the West. Need we mention that this decision was taken after the Arab embargo during the war of October 1973? Everybody recalls—"the sound and the fury" all this caused. But the fact remains that the Third World producers of raw materials saw in this a clear demonstration of their own power. Hope and self-confidence grew in those who had endured until then what they believed were the laws of

the market, and were instead nothing but the laws of the strongest. And it is at this point that the second historical event took place: the total victory of the Vietnamese people. The lesson to be learned from this terrible war, where the most sophisticated technology had devastating effects, is that strength, the last argument of the powerful, can become powerless in the face of the stubborn determination of an "underdeveloped" people.

A new set of rules

In the future, therefore, there will be confrontations because they are inevitable, and furthermore they are the *primus movens* of change. But we must also ensure that these confrontations do not cause the disruption of world economy and the regression that could follow it. What the international community needs more than anything else is a new set of rules involving forms and procedures that will allow, every time there is a conflict, to go from confrontation to negotiation. Must we add that a good confrontation always leads to a good negotiation? Thus the historical process of economic decolonization will be able to continue at minimum social cost. This process, we repeat, is already in progress. How long will it last? Considering only the active phase of political decolonization, it is to be noted that twenty years almost to the day have gone by between the Bandung Conference and the independence of Mozambique. Nothing leads us to believe that economic decolonization will take less time.

It is in this context that I consider the work carried out by the Seventh Special Session positive. It establishes the beginning of a dialogue, while a few months before, in the eyes of some statesmen, the claims of the Third World were pure, if not the worst type of rhetoric. The work reminds us of the resolutions adopted by the General Assembly, more than fifteen years ago, condemning colonialism. But the colonized people were not liberated by the simple power of words. These resolutions reflected a worldwide feeling of awareness against the colonial states which had been considered natural up to then. The actual liberation of the colonies often caused bloodshed. But it was encouraging for the people who were fighting to know that they had the sympathy of other people in the world. In fact, the importance of the growing feeling against colonialism inside the colonizing countries themselves cannot be

underestimated.

In the same way, economic decolonization will depend fundamentally upon the deliberate action of the Third World countries, upon the desire for social justice in these countries, and upon the close and multiform cooperation among the nations of three continents. But there, again, our interests converge with those of the people who, in the First and Second Worlds, are aware of the ineluctability of these changes and

work to bring them about. Let us add that, in this case, there are deeper reasons which favour a change, especially as the feeling of the profound unity of mankind increases.

Man is starting to reconsider the external limits of his productive activity, he is searching for new resources at the bottom of the sea, he wants to control space. Having set foot on the moon, he realized the fragility of his earthly basis. Is this a beginning of wisdom? Let us hope so.

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WEALTH FROM WASTE

COCONUT PITH

O.P. VIMAL

COCONUT pith or coir dust is the non-fibrous tissue of coconut husk. This light, fluffy refuse is the waste left over after the extraction of useful fibre from the husk. This product constitutes nearly 60 per cent of weight of the husk. It accumulates in abundance in the coir extraction centres in the coastal area of Kerala. Considering the vast quantities of coconut pith available (about 1.6 million tonnes) in factories manufacturing rubberised coir mattresses and also the disadvantages it offers to the fibre milling industry, it is highly worthwhile to explore the avenues for its utilisation.

Chemical composition

On an average, coconut pith contains about 35 per cent cellulose and 25 per cent lignin. The composition of samples obtained from various centres would vary depending upon the proportion of fibre shorts present as well as the source from which it is obtained, i.e., retted or dry decorticated husks. Ash content amounts to about 8 per cent with very low nutrient contents—N, 0.30 per cent; P_2O_5 , 0.05 per cent; K_2O , 0.09 per cent and CaO , 0.40 per cent.

Uses

Potentially, coconut pith can be utilised for the following purposes: 1. In building industry, 2. as a source of furfural, 3. for the manufacture of gaskets, 4. agricultural uses and 5. other uses.

In building industry

Particle boards prepared from wood, bagasse, etc., require the normal proportion of adhesive (6 to 9 per cent by weight) for bonding the particles; but coconut husk/pith is unique in that it has considerable self-bonding property. This can result in greatly reduced cost of production of particle boards. Other inherent advantages of boards from this waste are resistance to fire and

decay. Narayanamurti *et al*, showed that at a pressing pressure of 600 lbs/sq inch, boards with satisfactory properties can be made from coconut pith. At 800 lbs/sq inch boards with modulus of rupture over 600 kg/cm² can be obtained (*Board Manufacture*, Sept. issue, 1968).

Tropical Products Institute, London, also developed a process of making building slabs or hardboards from coconut pith but it was found that the presence of small proportion of soluble substances in this waste inhibits the setting of cement, thus making it necessary to use a rich mix. Therefore, it seems unlikely that coir dust can be used satisfactorily in the manufacture of hard board, for any application involving the use of water, unless the manufacturer is prepared to use extreme compressive pressures and still greater proportion of resin (Report No. G, 1968).

The possibilities of partial substitution of phenol in phenol formaldehyde resins by various ligno-cellulosic material was investigated by Narayanamurti and his co-workers. Usually the plywood boards are made by using the product obtained through the condensation of phenol (100 parts), formalin (185 parts) and sodium hydroxide (5 parts) but replacement of a part of phenol in this formula by coconut pith gave satisfactory results (*Paintindia*, Oct. issue, 1968).

Hume described a process for preparing hardboards from a mixture of coconut husk shorts and coconut pith. It was claimed that durable un laminated boards of any thickness capable of being sawed, nailed and glued could be produced. In addition, this board could be subjected to a process of petrification which renders it completely insect and weather proof and imparts it a stony appearance capable of taking colour finishes (*Econ Botany*, 3:42-45, 1949).

Coir dust in combination with rubber can form composition floor

ing, ceiling boards and similar material. Joint experiments carried out by Coconut and Rubber Institutes in Ceylon showed that these products can keep well without deterioration for a period exceeding five years.

Jayarathna developed an economical process for the manufacture of moulded articles for many domestic and constructional purposes. He could polymerise the lignin in coconut pith so as to effect their aggregation in the form of one mass and thus lead to the manufacture of moulded articles (*Ceylon Coconut Quart.* 11: 1, 1960).

Coconut pith is a durable light weight material having a very high thermal insulating value. The Central Building Research Institute, Roorkee has developed a process to manufacture concrete from retted coconut pith and portland cement. The novelty of the product lies in the fact that compared to the conventional insulating material, lime concrete, the cement-coconut pith concrete is much lighter, easier to apply and gives better thermal insulation for equal cost.

Expansion joint filler finds wide applications in all such construction work where joints in slabs, beams, and prefabricated components are to be filled up. At present, the country needs about one million sq. metre expansion joint filler valued at about Rs. one crore. With the increasing building activity in the country, the demand is expected to go still higher. The Central Building Research Institute, Roorkee, has developed a simple process of making this product from coconut pith, cashewnut shell liquid, phosphoric acid, calcium hydroxide, paraformaldehyde and rubber latex (*Research & Industry*, 9:35, 1964).

As a source of furfural:

The available analytical data shows that the organic matter in coconut pith contains about 8.1 to 11.4 per cent of pentosans (dry weight). On this basis a recovery of 4-5 per cent of furfural from coconut pith could be expected. Furfural is an important industrial chemical used in most of the expanding industries like petroleum, nylon, vegetable oil, plastics, synthetic rubber, resins and for the preparation of many other economic products (*Yojana* 19(12): 21-22, 1975).

For the manufacture of gaskets

At present the rubberised cork sheets are prepared from imported cork granules. The National Chemi-

Shri Vimal belongs to the Division of soil Science and Agricultural Chemistry IARI, New Delhi.

cal Laboratory, Poona, has developed a process for the manufacture of gaskets from coconut pith (NRDC Process No. 83091). This process consists of mixing the pith with neoprene and other ingredients and vulcanising the mix in a press under pressure and temperature insuitable moulds. These gaskets could be used in automobile engines and similar equipament as a substitute for rubberised cork sheets.

Agricultural uses

Coconut pith is reported to be useful in the reclamation of *Kaval lands* (*Indian Coconut J.* 5 159-161, 1952). It is an excellent soil mulching material and has been used for this purpose, particularly in coconut nurseries and in citrus culture. It absorbs as much as eight times its weight of water with which it parts fairly slowly. Two per cent pith mixed with sandy soil has been found to increase the water-holding capacity of soil by about 40 per cent. So, it is commonly used in gardening. It is of great use as a rooting, seed germination and soil conditioning medium but it has little manurial value.

Other uses

In addition to the above uses, Narayanamurti also suggested two other important areas where coconut pith could be utilised (*IPTRA Leaflet* No. 11, 1969):

- i. In storage batteries, it can be used as an electroplating additive;
- ii. In rubber compounding, it has been found to accelerate the vulcanisation reaction, to act as a tactifying agent and also to act as filler.

From this brief account, it is evident that coconut pith holds a great potential particularly as a partial substitute for phenol in phenol formaldehyde resin adhesives, as a filler for resin adhesives, as a raw material for moulded products, and more recently in the rubber and electro-chemical industries as well; but the main problem in the use of this bulky material is the difficulty of its drying to the desired moisture content. The material as available is very moist, containing over 500 per cent of moisture. So drying is an important and necessary operation before it can be economically exploited. Narayanamurti employed infra-red and fluidized bed drying techniques but still there is a need to study the optimum conditions for both types of dryers in order to evolve a suitable dryer which can dry the material at economic cost (*Coir*, July issue, 1969).

In order to make the industrial utilisation of coconut pith an economic proposition, it is highly essential to collect information on the following aspects:

1. The availability of coconut pith from each coir processing centre so as to work out the pockets of maximum availability;
2. The alternative uses of coconut

pith and the comparative economics of the products derived therefrom to those currently manufactured competitive products.

3. Level of technical know-how available and the appropriate agencies to undertake further research and development programmes.

4. Import substitution and export potential aspects. □

UTILISATION AND RECYCLING OF WASTES

A NATIONAL programme for the utilisation of mineral and industrial wastes as soil amendments is being formulated. Information on the availability of mineral wastes in the country has been collected and a base paper on its utilisation has been prepared. In addition, a Science and Technology plan proposed for the setting up of a data and documentation centre for agriculture and animal waste has been worked out for inclusion in the National Information Systems for Science and Technology programmes of the Department of Science and Technology.

Nine national coordinated projects are functioning for utilisation of agricultural and animal waste/by products, mineral wastes and community wastes.

In the area of agricultural waste,

a project formulated for improving the quality of rice bran for the extraction of edible oil has been funded by the Science and Engineering Research Council (SERC). As a first step the Food Corporation of India is conducting survey of different rice mills in Andhra Pradesh and Madhya Pradesh, and studying two types of rice—raw and par-boiled for this purpose. The product is aimed at preparing a guideline package programme for dissemination to the rice millers and farmers for increased availability of rice bran oil on commercial basis.

In the area of recycling of waste, efforts have been made to formulate a Research and Development project for the utilisation of cellulosic waste material and other plant material to obtain single cell protein.

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INDIAN IMAGES

ABU ABRAHAM

"FREEDOM is indivisible." Thus a British Labour MP chided me over lunch during recent Commonwealth Parliamentary Conference when I mildly suggested it might be wise for him not to get too involved with any Indian political groups. Anyone has the right to listen to any group of people he likes, and this MP, I assume, saw whoever he could. But my suggestion was because I feared that someone on a first visit to India, could be easily misled.

In any case, is freedom indivisible? It seems to me that it is one of the most divisible commodities in the world today. Nobody goes on world tours inspecting freedom—one carefully chooses the areas one wishes to take notice of. Thus, this same British MP, I know, will certainly not bother about the rights of liberties of the Palestinians nor for that matter the liberties of the Catholics of Northern Ireland. (I remember once, some years ago in London, pleading the cause of a united Ireland to a group of English radicals. The response I got was "The Irish are a bore.")

Things would have been different of course if the world had been more uniform, if cultures and values were commonly accepted. They would be different if nations were not organised into blocks and alliances.

Today the CIA can also say that freedom is indivisible, so the people of Chile had to be freed from Allende. President Johnson once said, referring to the war in Vietnam: "I love freedom so much that I want everyone to have a little bit of it."

The poorer nations are more vulnerable now than when they were under colonial rule precisely because they are free. There is no colonial master to fight for them. Any big power that may come to the rescue of a poor country will only do so on a variety of humiliating terms. Nations will of course act according to their self-interest. But what is objectionable is that some nations think they ought to decide what the self-interest of other nations is.

Jawaharlal Nehru's fault in Western eyes was that he wanted to remain "neutral," that is to say, he wanted to keep out of the ideological and power rivalries of the big powers and stay friendly to both sides. At a time when Mr. John Foster Dulles was making our flesh creep with the

vision of a Soviet-Chinese plot to dominate the world, it was Mr. Nehru who foresaw that the Russians and the Chinese would go in different directions. When he tried to bring India and China closer he was mocked as a feeble idealist. When China took control over Tibet, he was abused as an appeaser.

Fashions change but they don't ever change as quickly as among the intellectuals of Europe and America. With all that, Nehru was extraordinarily sensitive to Western criticism. But his daughter belongs to a different generation, a generation that didn't grow up in the sentimental glow of a fading English liberalism. She is a tough, pragmatic woman, respectful of democratic values but who will not tolerate interference from outsiders, whether they are well-wishers or ill-wishers.

She has a job ten times as tough, complex, and difficult as her father had. It is easy to find fault with her but I don't think that will stop her doing what she thinks needs to be done. She is, as far as I can judge, fed up of Western criticism. Naturally, because when she looks back, she cannot find a single occasion when the West (speaking generally) has supported India. In every crisis, India was in the wrong in Western eyes—Kashmir, Hyderabad, Nagaland, Goa, Sikkim, the wars with China and Pakistan.

We are the nation with the begging bowl so we ought to do as we are told. The begging bowl of Israel is much bigger, yet no one calls that country a beggar. Why?

What Mrs Gandhi and many of us who have supported her (not uncritically) are trying to assert is a certain national self-respect. Three hundred years of colonial domination has produced in our people a servility of mind, a dependence of spirit that are not easy to remove.

In recent years the dependence has also been material and ideological. Whether on the right or the left, there are a number of people who get their ideas (and money) from abroad. For those on the right (to quote a recent *New Yorker* cartoon) "any friend of laissez-faire capitalism is a friend of mine." For those on the left, any friend of Soviet communism is a friend of theirs.

Mrs. Gandhi's worry is to find a middle path ("left of centre," as she says) so that she can find solutions to

India's immense problems with the general consent of the people. She seeks this middle path not only in the country as a whole but within the Congress Party itself which, like the British Labour Party, covers a wide range of ideological shades. She, like her father, wants to keep her country out of the new cold war that has developed in the world.

The participants in this new struggle may be more numerous than in the 'Fifties, and the emergence of China as a big power may have introduced certain new variations in the conflict, but basically today's cold war remains the same as that of the 'Fifties.

The actors are, of course, different, instead of the messianic Dulles we have the menacing Moynihan. One swore by the "free world," the other swears by "free enterprise". The struggle for the world's resources has become acute, and the neurosis and fear that come with social and economic changes have gone down to the ordinary people. But the basic question asked to India as of other nations in the Third World is the same: are you for the Russians or are you for the Americans?

In terms of this cold war, Mrs Gandhi's troubles started in 1971, after the Bangladesh war and the Indo-Soviet Friendship Treaty. A well-orchestrated and subtle campaign started abroad and began to find its supporters in India. It was part of the general campaign against the Third World—if you can't bribe them, bully them; if neither works, then confuse them with international experts, thus undermining their self-confidence.

Tell them that without Western technology they will get nowhere and when they master Western technology say that the same technology is no good for them. If we construct dams, it is not good for ecology, if we manufacture cars, we will pollute the atmosphere. The world's resources are limited, so don't use up petrol, or raise its price. A chicken in every pot and two cars in every garage is good for the developed countries but we Gandhians should live like Gandhi, or by the year 2000 we will face doomsday!

I remember a distinguished British economist telling me once that India should not worry about growing its own food because America has such large surpluses that all we had to do was to buy their surplus grain. We have grown out of all that sort of advice. Not everything is rosy in India but we shall decide our own fate. We may be poor but our country is rich and we are not mentally underdeveloped. □

Sociology and Social Welfare

Social Work Education and Development of Weaker Sections. Edited by T. Krishnan Nair, Madras, 1975, pages XIII+197, Price not mentioned.

THESE METHODICALLY edited papers of the proceeding of a Seminar on Social Work (December 19-24, 1974), under the auspices of the Madras School of Social Work incorporate a few thought provoking and useful contributions on education and developmental problems of the weaker sections from an All India angle as well as from the standpoint of the specific needs of these sections in Tamilnadu. An economic appreciation of the problems of the weaker sections by Dr. Malcolm S. Adiseshiah followed by the role of the State in their development by O.K. Moorthy and the impact of legislations on the development of Scheduled Castes and Scheduled Tribes set the tone for the subsequent analytical and well written papers by Sarvashri S. Ramanathan, Sugata Dasgupta, M.S. Gore, S.N. Dubey et al.

The editor has done a competent piece of work in bringing out these papers in book form. When more and more of our economists and sociologists pay attention to the practical problems highlighted in this collection of papers, it is likely that they might be drawn towards social realities in greater measure than hitherto and also give up their double think! Hence, the present reviewer is inclined to attach more than the usual significance to the edited proceedings of the Seminar. The analogy of the Blacks in the USA cited by Sugata Dasgupta and S.N. Dubey to classify the responses typology of scheduled castes may be only heuristic but it does smack of an element of the spurious transatlantic influence in our sociological thinking that threaten to engulf urbanisation studies also. It is also undesirable that specialists in social

welfare should allow themselves to be outdone by sociologists who lack practical knowledge of field work and do not enjoy the status of sensitive social workers. One wonders what is the line of demarcation between sheer verbalizations of sociology and the pragmatic social welfare methodology laid down by the Seminar. There is an emerging field for several disciplines under social technology or social engineering that has to be owned by the rising spirited youth of the country rather than by the pious group of the present day sociologists of India of the functionalist orientation.

However, the plea that only economic conditions rather than membership of castes should be the base for providing benefits and rights is sound judgement for the use of policy framers in social welfare.

At a time when the socio-economic development of Tamilnadu is gathering momentum under President's rule this set of papers, particularly those throwing light on the scheduled Tribes of the State could be found useful by readers outside the State. The participants from the Delhi School of Social Work, Drs. K.D. Gangrade and T.N. Kitchlu have set out the details of a training programme of the Schools that is both purposive and plan-oriented. That the Association of schools of Social work in India (ASSWI) could focus on these vital problems, without foreign aid or the christian missionary's compassion is at once a leadership of the Prime Minister. It is not merely diagnosis that is required but also prescription with strict enforcement. The book, therefore, requires to be widely read, if need be under a new edition.

—B.N. Nair

The Menace of Adulteration

Food Adulteration by Mrs. Thanakamma Jacob; Macmillan Co. of India Ltd., New Delhi, 1976; Pages xii+161, Rs. 12.

THIS well-written book by a seasoned specialist in pure and applied chemistry actively associated with several consumer oriented organisations is both topical and informative. The author has covered a broad range of problems resulting from food adulteration in the Indian setting with special documentation on common adulterants in foods, e.g., milk, milk products, salted products, cereals and pulses, spices, sweets and sweeteners, edible fats and beverages. The discussion on metal contaminants arising from lead, mercury, cadmium, tin, arsenic, copper, zinc, antimony, aluminium, chromium, cobalt, etc., brings home the health hazards to the reader in a convincing manner and with the flavour of popular science.

The treatment of bacterial and fungal contaminants, e.g., clostridium

boluitridium, staphylococcus, salmonella, bacillus cereus and shigella has been given in chapter Four followed by an illustrated chapter on pest and pesticide contaminants and those related to processed foods. Not the least important of the entire treatment of the subject is the details of quality and international standards on food and other scientific data embodied in the contents at appropriate places.

The author deserves the gratitude of the readers in having dealt with a technical subject in lucid style and with a vibrant feeling of concern for the welfare of the consumers. Being a handbook of considerable value, it deserves to be translated into all major languages and distributed in all States. If only its reading is made compulsory for all dealers of food-stuffs and wholesalers of processed foods backed by visual publicity, the hidden persuaders of commercial publicity that hide these truths could be kept under proper check.

—N.N. Chatterjee

Management of Steel Industry

Public Sector Steel Industry in India.
by G.C. Aggarwal; Chaitanya Publishing House, Allahabad, 1976; Pages 528 + XVI; Price Rs 45.

THE PRESENT STUDY seeks to evolve a suitable pattern of management for public sector units. Drucker has pointed out that the world management denotes a function as well as the people who discharge it. We do not speak of management or manager as a rule. Universities or Government agencies have administrators. Armed services have commanders. Other institutions speak of executives and so on. But all these institutions have in common the management functions. In the study under review, the author has pointed out that the issue of public versus private sector now appears obsolete. The question today is how to improve the performance of public sector enterprises.

The Planning Commission had observed that the membership of the Management board should be open to men of ability, experience and administrative competence both from within the public sector undertakings and outside. But this is not being strictly adhered to. The author has suggested to appoint an Advisory Body to collect information regarding the availability of personnel with sound background. This Advisory Body will recommend names suitable for appointment as directors to the Minister; in case of difference of opinion, the matter may be discussed by the Cabinet Sub-Committee. The authorities should consider this suggestion in order to improve the functioning of the Board of Directors.

For Chairman's post the author says that an executive cadre be formed so that top personnel are absorbed by the organisation. In no case, the post should become the resting ground for retired civil servants.

While dealing with the development of Steel Industry during the Fourth Plan, the author has given a table, on page 14, which shows investment in the Iron and Steel Industry till 1966. The author should have tried to up date this data. The investment pattern has changed much during the decade 1966-75.

It is observed that in a number of tables, the source is not indicated, particularly the tables showing the scheduled date and actual date of commissioning of various units. In

a number of cases, operations have been confined uptill 1964-65. In the case of Dugda Washery (Page 78), the author has given the working conditions obtaining only till 1964-65.

The study appears to be incomplete in the absence of a chapter on SAIL. However, the author has given a good bibliography at the end but has failed to give an index.

—Rabindra Nath

The Unbreakable Bonds

Time-Tested Treasure by Hiren Mukerjee; Allied Publishers (P) Ltd., New Delhi; Pages 72; Rs. 20.

THIS slender volume by the well-known scholar Hiren Mukerjee, M.P., contains recollections and reflections of the author on the earlier phases of Indo-Soviet friendship. "As I have tried to gather my thoughts I have relived", he says, "especially, the days that followed 22 June 1941, when Hitler began his perfidious and enormously powerful attack on Soviet land. For many of us in India they were long days of anxiety, even anguish, but days also of hope, of sure confidence in the victory of the Soviet Union."

The author stresses that the unbreakable bonds that link India and the Soviet Union have been forged over many years, especially, during the years of glory (1941-45) when the Red Army and the Soviet people astonished the world by sustained heroism and truly creative labour unexampled in history.

In British colonial India it was considered dangerous to be the friend of the Soviet Union. Even in that period there was a strong link between India's struggle for freedom and her friendship for the first socialist State in the world.

It may be recalled here that in 1941, that hard year of trials for the Soviet people and for the entire progressive mankind, the first organisation of its kind—Friends of the Soviet Union (FSU)—was set up in India. Hiren Mukerjee was one of the founders of that organisation. Through underground channels the FSU disseminated authentic information about the Soviet Union. The leading Indian revolutionaries and the intelligentsia showed a great interest in the activities of this organisation and associated themselves with it.

In *Time-Tested Treasure*, Hiren

Mukerjee recalls and tells about those days of pain, bitterness, suffering and losses, days of hope and confidence in the final victory of the USSR over Hitler's fascism. He has devoted this book to the 30th anniversary of the great victory that brought liberation to the peoples of the world and gave an impetus to advance along the road of peace and progress. This book is about the love of the Indian people towards the country of the great Lenin. And today India has the friendliest of relations with the Soviet Union. These bonds of friendship have been further cemented by the visit of L.I. Brezhnev to India and the signing the Indo-Soviet Treaty of Peace Friendship and Cooperation. *Time-Tested Treasure* is a valuable addition to the literature on Indo-Soviet relations.

—Pritam Lal

BOOKS RECEIVED

Indian Women Through The Ages by H.N. Verma and Amrit Verma; Great Indian Publishers, New Delhi; Price Rs 40.

Wage Structure And Labour Mobility In A Local Labour Market by T.S. Papola and K.K. Subrahmanian; Published by Sardar Patel Institute of Economic and Social Research, Ahmedabad; Price Rs 45.

Economics Of Hedging by M.G. Paraskar; Popular Prakashan, Bombay; Price Rs 30.

Planning For Shankargarh Block by Kripa Shankar; Arthik Anusandhan Kendra, Allahabad; Price Rs 10.

Agricultural Development—A Case Study by Vasant Desai; Popular Publications, Bombay; Price Rs 40.

Development Notes

Expansion of Haldia Oil Jetty

The oil jetty of Haldia project will have two additional Outer Dolphins. An amount of Rs 60 lakh has been sanctioned for their construction.

The Haldia project envisages the construction of six berths and an oil jetty capable of berthing big bulk carriers and oil tankers. The six berths are one each for coal, ore, fertilizer, general cargo, salt and a berth for handling heavy lifts.

The oil jetty was commissioned in August 1968. A number of tankers have already visited the jetty several times when the draught was about

20 feet. The draught has since been raised to 35 feet and is likely to reach a depth of 44 feet by 1980.

The Haldia Dock system would be one of the unique and the largest Dock built in the country. It has been entirely planned, designed and executed by Indian engineers and experts. The Dock, for example, will have the largest Dock system east of Suez. Each gate of the Dock would weigh about 600 tonnes. These gates normally manufactured in the basin were constructed outside horizontally and put up later in vertical position.

Kandla Free Trade Zone

The value of exports effected from the Kandla Free Trade amounted to Rs 21.92 million during 1975-76 which was a 22 per cent improvement over the export level of Rs 18 million in 1974-75.

The major product-groups in which the exports took place relate to engineering, processed foods and textiles. In the engineering group, export trade in stainless steel utensils from this Zone totalled Rs 8.89 million and hand-knitting machines Rs 1.68 million. Of the processed

foods peanuts and cashewnuts figured prominently and they earned over Rs 7 million in 1975-76.

The exporting units in the Kandla Free Trade Zone also succeeded in supplying drugs and pharmaceuticals, plastic products and ivory craft to the overseas markets.

The Zone has 23 manufacturing units of which 18 are in the small scale sector. In addition, 57 units have been approved for producing a wide range of products.

Export of Readymade Garments

Readymade garments have come to occupy an important position in India's export trade. In 1974-75 our export earnings from these garments stood at Rs 1020 million. During April-December 1975 the exports are estimated to have aggregated Rs 1173.7 million. In 1971-72, these exports realised hardly Rs 178 million.

Readymade garments in cotton have particularly improved their offtake. In 1974-75, these exports fetched Rs 950 million while in the first three quarters of 1975-76, they netted Rs 1102 million. Some exports of readymade garments in man-made fibres, woollen and silk also have been taking place every year and their share in the garment exports have been growing in recent months.

It is estimated that in the full year 1975-76, the total garments exports from India would be in the neighbourhood of Rs 1400 million. Handloom garments account for more than 50 per cent. The garments exported are mainly

in the category of fashion and casual wear garments as also in the category of conventional wear. With a view to encouraging large scale supplies to the international markets, the Government of India have been permitting the establishment of integrated garment units under suitable stipulation for exports.

Indian supplies to Europe constitute the highest share accounting for about 70 per cent followed by America at about 27 per cent (1974).

The State Trading Corporation of India has entered the readymade garments export field in a big way. In the full year 1974-75, the Corporation's export value from garments aggregated to over Rs 27 million and it is estimated that in 1975-76, the export figure was in the neighbourhood of Rs 52.5 million. Currently, STC's export endeavour is primarily directed to West European and American markets particularly France, USA, UK apart from USSR.

Indian Coal for EEC

The first break-through in the export of Indian coal to European Economic Community (E.E.C.) has been made with the signing in Brussels of a contract between MMTC and Belgian-British Coal Company, Antwerp on May 6. According to the contract two ship loads of 15,000 to 25,000 tonnes each of non-coking coal meant for power generation are to be supplied from Paradip Port starting end June or early July, 1976.

Indian coal has been found to be quite acceptable to the power stations in Western Europe; its lower sulphur content gives it an added advantage as it causes less pollution

than coals being imported into Europe from other countries.

At present EEC countries are importing about 40 million tonnes of coal per year, mainly from USA, Poland, USSR, Australia and South Africa. In view of its increasing import requirements, the Community undertakings are prepared to participate in joint ventures in the coal industry of non-member countries. The Indian authorities have already initiated talks with the EEC for financial and technological collaboration in the development of export-oriented mines and infrastructural facilities in India. This is necessary for supplying coal to EEC on a long-term basis.

Plants For Lime and Clay

Demonstration-cum-Training Plants for Dry Hydrated Lime and Clay Pozzolana (Reactive Surkhi) have been inaugurated at village Sultanpur about 20 kilometres from Delhi. These plants would help reduce 'Ruinous Imitation' of the western building construction techniques and materials used, which are not necessarily suited to the Indian climatic conditions, terrain and economic advancement.

Unfortunately in our country the status of a person is judged in terms of the amount of cement used in the construction of his house. The National Buildings Organisation (NBO) has fortunately reversed the historical process by making lime once again popular in the construction of buildings in the country. NBO had successfully demonstrated at the Low Cost Housing Exhibition held in Delhi that lime

could be usefully utilised in the construction of houses.

Both these plants have been set up by the National Buildings Organisation at a cost of about Rs 15 lakh and will together produce daily about 75 tonnes of Dry Hydrated Lime and Clay Pozzolana. The utilisation of these materials in building construction will result in a saving ranging from 9 to 25 per cent depending upon mortar mix used, besides providing improved workability, compressive strength etc. Lime can also be used with advantage for soil stabilisation and in chemical industries. These plants will provide employment to about 100 persons.

The ex-factory rates of Quick Lime will be Rs 150 per tonne, Dry Hydrated Lime Rs 300 per tonne and that of Clay Pozzolana (Reactive Surkhi) Rs 165 per tonne.

Limestone Crushing Plant at Bokajan

Cement production in the north-eastern region will get a further fillip with the commissioning of the limestone crushing plant of a capacity of 200 tonnes per hour for the cement works of Cement Corporation of India at Bokajan in Assam. The plant is capable of crushing the run-of-mine limestone from 750 mm to below 25 mm size. The plant is the first of its kind in the north-eastern region and has been implemented by Engineering Projects (India) Ltd (EPI) a

leading prime contracting company in the public sector.

The main feature of the plant is the sophisticated equipment installed by EPI. All the mechanical equipment is electrically interlocked and is operated from a centralised control station.

EPI has successfully completed six projects including two overseas assignments. The company has in hand 42 projects of the total value of about Rs 1,600 million including 12 export orders valued at about Rs 400 million.

Silk Exports

The silk industry of India has achieved the export target set for the year 1975-76 even within the first eleven months of the year. The export value during April 1975-February 1976 stood at Rs 147 million as

compared to the target set at Rs 145 million. The export value in this period has registered a remarkable increase over the export earning of Rs 112 million in the corresponding period of 1974-75.

The export growth was

both in terms of value and quantity. In terms of value, the export performance increased by 31 per cent, while in terms of quantity, it increased by nine per cent.

UK continued to top the list of importing countries. The offake by France, Federal Republic of Germany, USA, Italy and Switzerland also registered encouraging

trends. Silk scarves and dress materials exhibited particular dynamism. The Federal Republic of Germany accounted for the bulk of the tussar silk goods exports.

As the 20-Point Programme has given emphasis on the handloom sector, the silk trade is poised for greater involvement in the production programme envisaged.

Record Telecom Expansion

After the proclamation of Emergency, 1,39,300 telephones were installed as against 25,700 in the pre-Emergency period last year. As against 19,635 direct exchange lines added before the Emergency, 1,05,364 (net) lines were added after the Emergency.

The equipped capacity of the telephone exchanges in the post-Emergency period was 1,21,700 lines as against 13,300 in the six months

before June 1975 taking the total to 1,35,000 lines.

The routes on which No-delay Trunk Service was introduced increased by over six times. As against 10 before the Emergency, 76 were added afterwards.

30 point-to-point STD routes were commissioned after the Emergency.

In all 103 STD routes were added during the year.

Bharat Aluminium Sets New Record

The new public sector aluminium smelter at Korba of the Bharat Aluminium Co. Ltd. (BALCO), has achieved 100 per cent capacity utilisation within just one year of its having gone into production. The unit was commissioned in May last year. It has already reached its capacity of 25,000 tonnes of aluminium metal per annum.

Another unit of BALCO with 25,000 tonnes capacity is expected to be commissioned towards the second half of the current financial year. The total capacity of the Company when all the four phases are completed, will be 100,000 tonnes per annum.

The Korba Smelter has set up a new record in the production of aluminium metal of electrical conductor grade purity also. This is required for the manufacture of cables/

conductors used by the State Electricity Boards. Nearly 85 to 90 per cent of the metal produced by the Korba Smelter is of E.C. grade purity.

Bharat Aluminium has made a considerable headway even on the export front. It has already exported about 75,000 tonnes of alumina. Another 40,000 tonnes of alumina will be exported to the USSR within the next six months. The Company has also exported 4,000 tonnes of aluminium ingots in the last two months and is expected to export another 1,000 tonnes very shortly.

Recently the company installed a new wire-rod manufacturing unit.

Apart from achieving maximum production and making a headway in exports, Bharat Aluminium has also been taking a lead in reducing the price of non-levy aluminium.

HSL Production Increases

The production of the Hindustan Shipyard Limited increased to 51.12 per cent, according to their annual report for the year 1974-75 released recently. The cost of production mainly included ship construction and ship repairs which amounted to Rs 2299.70 lakh as against Rs 1521.81 lakh during the previous year.

During the year under report, three vessels were delivered to the owners, keel was laid for five vessels and three Pioneer Class ships were launched. The first Pioneer vessel of 21775 DWT delivered during the year was the largest built in India.

The ship repair and dry-dock charges totalled Rs 258.

17 lakh as against Rs 134.36 lakh during the previous year. These charges crossed Rs 300 lakh during 1975-76 and were expected to exceed Rs 400 lakh during the current year when the Wet Basin would be commissioned.

The Shipyard made a net profit of Rs 24.76 lakh after providing Rs 54.14 lakh for depreciation and Rs 64.43 lakh as interest. Work on the construction of the Wet Basin began in 1972 and the civil works were completed in October 1975. An expenditure of Rs 280.28 lakh was incurred on the project upto March 31, 1975. The Basin was expected to be completed in the current year.

20 Pt Economic Programme

Welfare Measures for Weaker Sections

A sum of Rs 519,000 has been advanced to 295 Scheduled Caste persons under the 20-Point Economic Programme in the Union Territory of Chandigarh. Out of this, Rs 28,000 was advanced to 94 members of Scheduled Caste by Agricultural Credit Societies, Rs 316,000 to 211 persons by Non-agricultural Credit Societies and Rs 175,000 to 60 persons of the same community by Dairy Co-operative Societies.

About 33 Scheduled Caste families have been provided with free house-sites. Seven more economically backward classes have also been allotted house-sites.

Sixteen Scheduled Caste persons have so far been placed as apprentices in various factories under the Apprenticeship Scheme. Efforts are afoot to locate more seats. For this employers are being persuaded to employ more and more Scheduled Caste apprentices.

Minimum wages fixed in 1971 at Rs 3.50 per day for agricultural labour have now been revised to Rs 6.50 per day under the Minimum Wages Act, 1948. Similarly, the wages of whole time servants have been doubled from Rs 600 to Rs 1200 per annum. Wages of other categories of farm labour have also been substantially enhanced.

Houses for the Landless

About 61,14,000 house-sites had been distributed to landless workers in the country till the end of March this year, covering well over half of the eligible families for allotment of house-sites.

Many State Governments have taken initiative for construction of houses on the sites. The Government of Kerala has launched a special scheme known as 'One Lakh Houses Scheme' to provide permanent low cost dwelling houses on developed sites to the families of landless labourers in rural areas. The area of each dwelling unit will be 23 square metres, comprising a bed room, a multi-purpose room besides the kitchen. The approximate cost of each house works out to Rs 1400.

The Karnataka Government has also formulated a scheme called 'People's Housing Scheme' for construction of houses on the sites allotted to landless workers. Under the scheme the State Government contributes Rs 1,000 and the allottee Rs 500. The balance amount incurred for the construction of houses is treated as loan recoverable in 20 years.

The Government of Maharashtra has also launched a scheme for the construction of huts on house-sites allotted to rural landless. The allottees of houses contribute voluntary labour, while the Government helps them to construct hutments at a cost of Rs 200 per hut. Till the end of March, about 1.25 lakh huts had been constructed under the scheme.

The Government of West Bengal has drawn up a crash programme of construction of houses. About 40,000

houses are proposed to be constructed in the districts by June 30.

The Tamil Nadu Government has set up a Harijan Housing Development Corporation for the construction of houses for the Harijans. 6,354 houses have already been constructed and another 13,082 houses are under construction.

In Orissa, an Integral Scheme has been drawn up to provide house-sites.

The facilities provided by the Government of Madhya Pradesh includes ballies and bamboos for those residing within a radius of 30 miles of reserve forests and free extraction of clay, sand, murram and stone from Government quarries.

The Andhra Pradesh Government proposes to undertake a massive housing programme for the landless backward communities in rural areas, under which loans will be advanced through special cooperative institutions.

The Central Government has requested other State Governments also to launch similar schemes in their States and also explore the possibilities of formation of cooperative housing societies by the allottees so that they can avail themselves of the loan facilities given by the Life Insurance Corporation, Apex Housing Finance Society for house building.

While allotting house-sites to landless workers every effort will be made to see that allotment does not result in segregation of families belonging to Scheduled Castes and Scheduled Tribes and that they are suitably interspersed with other families.

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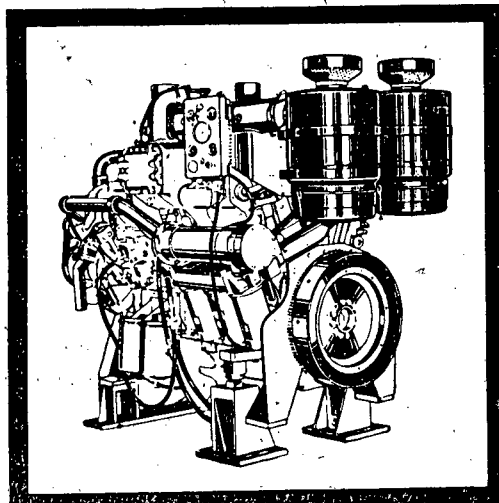
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