

The Ecologist

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Vol.5 No.8

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The Rural Solution • The Relevance of Gandhi



"We are the dwellers of woods and it is mountains and forests that nourish us. He who nourishes, His worship alone is proper."

KRISHNA

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THE VIEWS EXPRESSED IN THIS ISSUE ARE
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OTHER CONTRIBUTORS

This Month's Cover: Govardhan Dharan (The Upholding of Mount Govardhan, by Mola Ram (1743–1833))

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INDIA

This issue is about India's future. It does not deal with political institutions for these are likely to play but a secondary role in shaping it. Nor does it deal with India's industrial sector, for if the Indian people is to have a future, it must first learn how to feed itself on a sustainable basis, not how to provide itself with manufactured goods.

The first part is concerned with the land, for it is from the land that man derives his sustenance, and if we in Britain fail to realise this, it is only that for so long, we have exploited other people's land, to which we have exported our surplus population and from which we still obtain (but not for much longer) more than half our food.

Thus India's agricultural potential is carefully examined (Swaminthan) as are the measures required for preserving the land from further deterioration (Vohra) the means of deploying the population so that it exerts the minimum impact on the land, and of providing the population with the technologies which are least destructive to it (Kapur).

The notion of an urbanised society on the western model does not seem feasible (Kapur) – India's future is clearly to be a rural one.

The essential problem of population is not dealt with here, but in a future issue it will be shown that it is only in a decentralised rural society, in which the villagers are largely responsible for the conduct of their own affairs, that this daunting problem can hope to be solved. Indeed in trying to solve any of India's problems at any level higher than that of the village, the massive logistical problems encountered (among many others) are simply insuperable.

The second part of this issue is concerned with the social philosophy of Mahatma Gandhi. The reader will be able to establish for himself just how extraordinarily relevant it is to the solution of the problems raised.

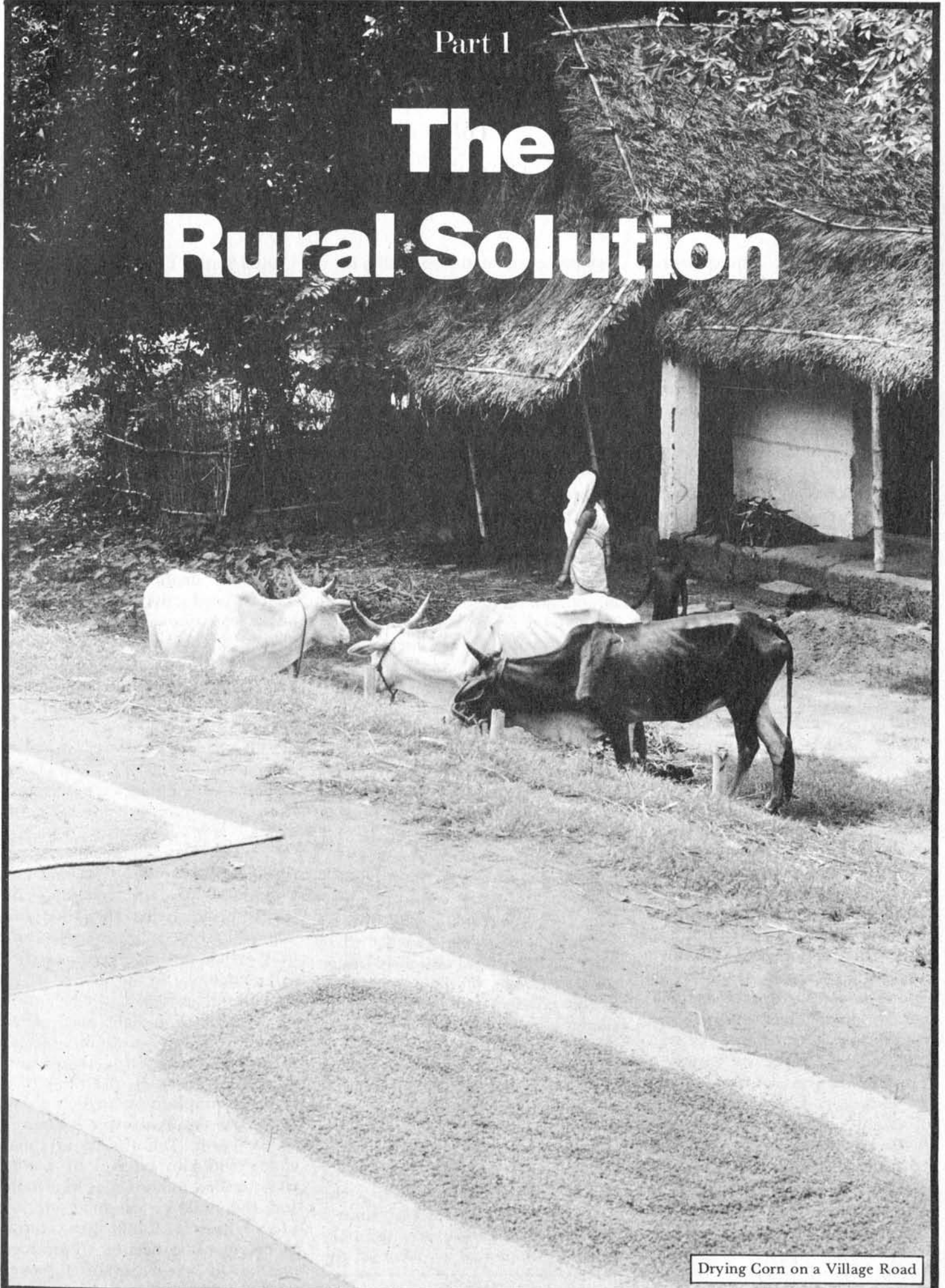
My thanks to Satish Kumar who arranged my journey to India earlier this year and who gave much help with this issue.

Also to Rada Krishna, my host at The Gandhi Peace Foundation, New Delhi, where I stayed whilst collecting material for it.

Edward Goldsmith

Part 1

The Rural Solution



Drying Corn on a Village Road

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India's Agricultural Balance Sheet

by

Dr. M. S. Swaminathan

Food is a basic requirement in the hierarchical needs of man. The successful domestication of plants, animals, soil and water by settled human communities has hence been the starting point for the evolution of culture and orderly Government. Ironically, the very centres of civilization, where the domestication of plants and animals took place in the past, are the areas which are struggling today to find an honourable equation between population growth and food supply on the one hand, and population growth and opportunities for productive and remunerative employment, on the other. The secondary and tertiary centres of origin of agriculture have, in contrast, more than enough to eat and constitute the developed or rich nations of the world. It has been estimated that in the poor nations, which have contributed most of the domesticated plants and animals to the world, nearly 800 million individuals, live under conditions of absolute poverty, resulting in protein-calorie malnutrition, squalor, illiteracy and disease. Again, ironically, the lands of the poor have often greater biological assets, the most important of which is abundance of sunlight throughout the year, rendering the historic concept of cereal inapplicable. This word refers to crops which grow during only part of the year, being derived from the myth of Ceres' happy seasonal reunion with her daughter. In our earth, appropriately compared to a spaceship by Buckminster Fuller, the first class compartment, which the rich nations as well as the rich of the poor nations occupy, is consuming a greater and greater proportion of the available resources, thereby making life for those living in absolute poverty more and more hard. Those living in the first class

compartment of the spaceship have forgotten the meaning of the prayer "God, give us our daily bread", while for the vast majority of humanity squeezed into the small second class compartment, "God is bread", to use the words of Mahatma Gandhi. Why are we in this state of paradox? Why do plants seem to be unhappy and hence not so productive in their historic native homes?

Contrasting Trends

The state of food and agriculture in the world shows two contrasting trends. In one kind of agriculture, larger and larger farms are being farmed by fewer and fewer cultivators. Such farms are highly automated and capital-intensive. Let me cite an illustration. A recent article on computerized farming in California tells how a firm called Superior Farming Company, owned by a Texas Oil Company, raises 26 different crops on about 6,000 hectares, with land and equipment worth about Rs. 30 crores. In this agri-business, an irrigation system, called the drip method, brings individually piped water to every fruit tree and regulates the flow to a trickle, supplying exactly what each tree needs and no more. Under such systems of farming, not only is the efficiency of use of inputs like water and fertilizer high, but labour productivity also is very high. In one study conducted during the mid-fifties, it was found that while in many countries of Asia and Africa about 2.5 to 10 work days were needed to produce one quintal of grain, the extent of labour time needed to produce the same quantity of grain was about 3 hours in parts of France and only 6 to 12 minutes in parts of the

United States. The gap in the relative productivity of farm labour was therefore about 1 to 800 even over 15 years ago and this gap, which also represents the relative earning and purchasing power of farm labour, has been growing ever since.

In many of the poor nations, including our own, smaller and smaller farms have to be cultivated by the same or even larger number of farmers. The percentage of work force employed in farming in India was 72.1 in 1971 and it is anticipated that this percentage will remain practically unaltered in 1981. The relative productivity of small farms, however, varies widely in the world. Mr. R. S. McNamara, President of the World Bank Group, pointed out recently that "if Japan could produce 6,720 kg. of grain per hectare on very small farms in 1970, then Africa with its 1,270 kg., Asia with 1,750 kg. and Latin America with 2,060 kg. per hectare have an enormous potential for expanding productivity".

Agricultural Growth

Besides farm size and land and labour productivity, the other two major differences in the agriculture of the rich nations as compared to the poor ones, are in the pattern of agricultural growth and the nature of the food chain. The mechanised and low-labour consuming agriculture has achieved increased productivity largely on the basis of a high consumption of energy derived from the non-renewable resources of the earth. Thus, while in 1964, about 286 kilo calories of energy were needed in countries like India and Indonesia to produce one kg. of rice protein, 2,860 kilo calories of energy were needed to produce one kg. of wheat protein and over 65,000 kilo calories to produce one kg. of beef protein in the United

* Crores: Tens of thousands

States. Such a situation has now resulted in a widespread awareness of the simple truth that any finite resource, if exploited in an exponential manner on the assumption that the resource is infinite, will some day or the other get exhausted, thereby bringing the pattern of growth based on its consumption to ruin. It has also become clear that the tools of modernisation of agriculture, like pesticide, fertilizer, farm power and water, if indiscriminately used and excessively, based on non-renewable resources, will end in crises, now referred to as 'ecological crises,' 'energy crises' and so on. For example, 96 per cent of the energy input in the United States in 1970 came from oil, gas and coal, while in the same year non-commercial fuels like dung, firewood and wastes provided 52 per cent of our energy needs. The reserves of the fossil fuels are expected to decline rapidly in the next 30 years and even now, we have started witnessing some shortages of the most desirable fuels. Our agricultural production process is still predominantly based on the use of renewable resources but our current productivity is very low. Hence, there is urgent need for the development of technologies where the productivity of land can be continuously increased with diminishing dependence on non-renewable components of energy, by deploying recycling processes more and more effectively. A consequence of the agriculture of the high-energy-consumption and low-labour input pattern is the diversion of labour from agriculture to more industrial pursuits and a close linkage between farm and factory. Diversification of labour use, leading to a reduction in the number of people employed in the physical operations of farming, has historically been associated with a rise in the standard of living.

Contrasting Food Chains

A biological consequence of affluence has been a rise in the consumption of animal products. The poor and rich nations are hence characterised today by the former depending largely on the plant-to-man food chain and the latter, on the plant-animal-man food chain.

Consequently, the average per capita consumption of grain is about one tonne per year in the developed nations, out of which only about 70 kg. are consumed directly in the form of bread, biscuits, cakes and other products made from flour. The remaining 930 kg. are used to feed animals whose products like meat, milk and eggs are consumed by man. In contrast, the per capita consumption of grain per year in the developing countries is about 190 kg., most of which is directly consumed.

To summarise, the two major contrasting systems of agriculture we see today differ in the size of farm, the proportion of work force employed in agriculture, the types of linkages developed between farm and factory, the extent of consumption of non-renewable resources of energy, management efficiency, per capita productivity and income and the extent of use of animal products in daily diet. Our need is an agricultural system where the benefits of a large human and animal population, robust soils, abundant sunlight, rich ecological diversity, availability of large quantities of organic wastes and a fairly extensive irrigation network are optimised in a manner such that productivity is continuously increased without damage to the long term production potential of the soil, stability is imparted to the production as well as prices of foodgrains and labour and land use diversified, so as to increase real income and purchasing power. The mode of achieving these goals was summed up beautifully by our President Shri V. V. Giri when he called upon us to make "Every acre a pasture and every home a factory".

About 10 years ago, some foreign experts believed that India could never become self-sufficient in its food requirements. They predicted the outbreak of widespread famine and hunger in India on the basis of theoretical calculations of the year when the food needs of the poor nations would exceed the capacity of the rich nations to meet them. Paul and William Paddock, for example, fixed this year as 1975. Some others felt that such a contingency would arise only in 1985. Our failure to achieve during the

nineteen fifties and early sixties the anticipated results with the Community Development and the Intensive Agricultural District Programmes fanned the sentiments of the pessimists. It was widely believed that in our rural areas developmental action and achievement were being impeded by the limited sights of our farming community. Experts wondered why we should find it so difficult to become self-reliant in our food needs, when there appeared to exist several easy pathways of attaining this goal. An expert on rodent control would thus advocate the control of rats to wipe out the deficit in our food budget, while the agronomist would plead for using good seeds and some fertilizer for achieving the same end. The fact remained, however, that progress in improving production was slow and largely took place through an increase in the cropped and irrigated area, rather than through any appreciable increase in productivity. The economic plight of the small farmer remained unchanged since his real income would rise only if productivity was improved and marketing organised so that the small producer got a fair share of the price paid by the consumer for a commodity. While Government was anxious to push up agricultural production and Jawaharlal Nehru gave expression to this desire by his oft-quoted statement "Everything else can wait but not agriculture", there was despair during the drought years of the mid-sixties concerning our agricultural destiny.

Famines and Scarcities

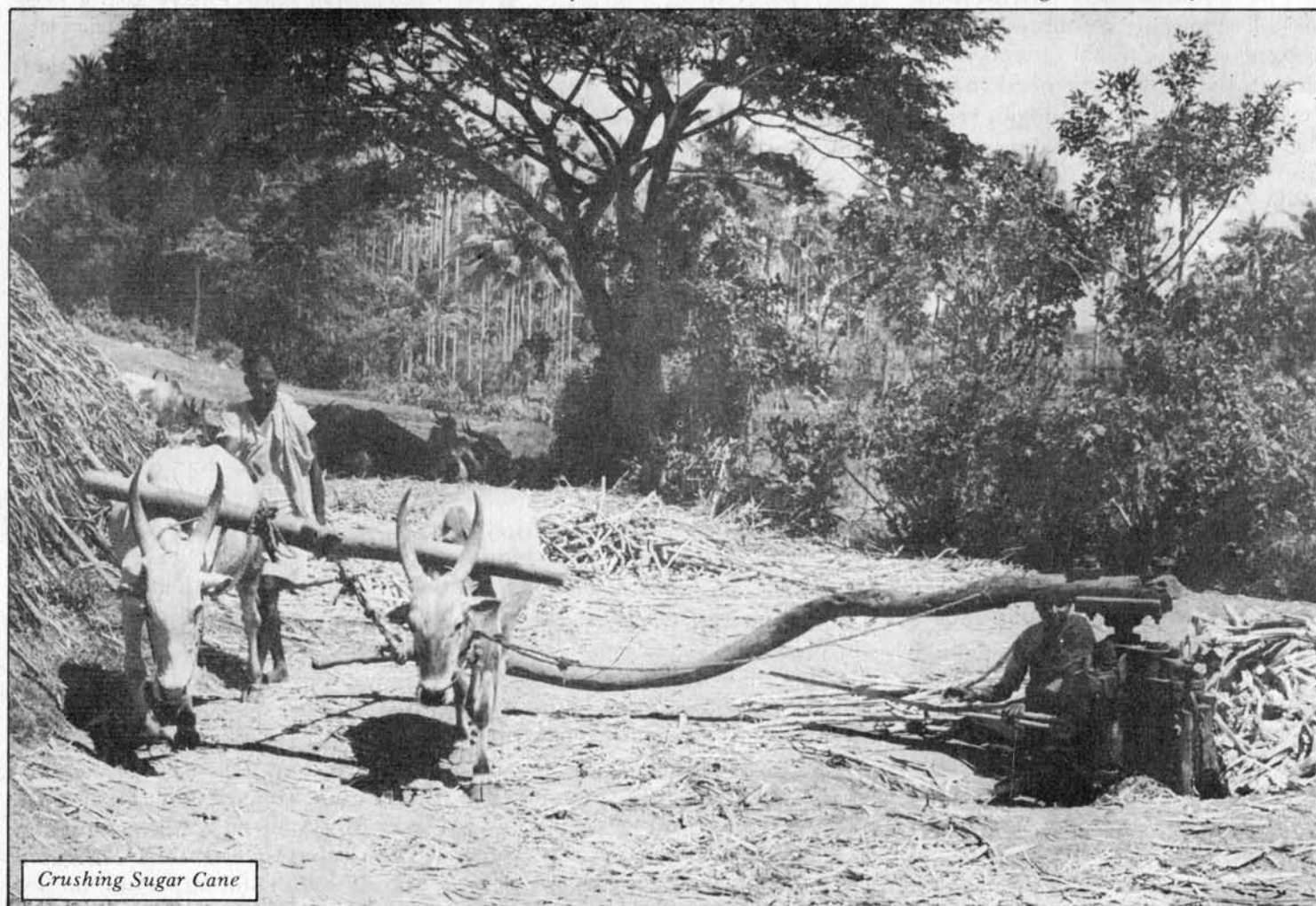
Historically, famines and scarcities have been known in our country from the earliest times. They are mentioned in Mahabharat and there is a Jain legend of a 12-year famine in the fourth century A.D. It is recorded by the official historian in the Badshah-Namah that in the famine of 1630-32, the Emperor Shah Jehan opened soup kitchens, gave a lac and a half to charity and remitted one-eleventh of the land revenue in the affected area. Subsequently, there have been numerous famines but it was only during the famine of 1868-69, that it was clearly stated that "the object of Government was to save every life".

The birth of agricultural departments in our States and of Famine Codes took place as a result of the recommendations of the Famine Commission of 1878. The Scarcity Manuals currently used by several Governments are largely based on the Famine Codes of the last century. B.G. Verghese's penetrating articles entitled *Beyond the Famine* and *A Blessing Code Named Famine* on the droughts of Bihar and Maharashtra have highlighted the advantages conferred on the helpless rural population by famines, since it is only during such crises that at least some food and employment are assured to those living in absolute poverty.

Meanwhile a silent revolution has been taking place in the minds of our farming community as a result of the new production technologies introduced through the High-Yielding Varieties Programmes, Intensive Cotton District Programme including hybrid cotton which was introduced into commercial cultivation for the first time in the world and the Cattle Cross-breeding projects. Obsession with destructive criticism

has blinded us to the meaning and implications of the increase in wheat production from a little over 12 million tonnes to over 27 million tonnes in just six crop seasons beginning from 1967-68. There has not been much interest in studying how a small Government programme in wheat was converted into a mass movement by our farmers. It is not only in the Punjab or Haryana that wheat production went up dramatically but also in non-traditional wheat areas like West Bengal. While in the past it was difficult to induce farmers to take to a rat control operation, farmers took pains, in the wheat belt, to see that rats did not migrate from sugarcane fields to wheat. While in the past everyone knew that farmers were sitting over a large underground water resource in the Indo-Gangetic plains, it was only the introduction of high-yielding varieties of wheat and rice that provided the necessary motivation for them to take to the construction of tube wells — whether made of metal or of bamboo — on a large scale. The truth of the saying "Necessity is the mother of inven-

tion" was proved to be true in the case of wheat cultivation, where farmers somehow managed to produce or get the seeds they needed, use diesel pumps if electricity was not available and get the requisite number of threshers and other implements as well as storage bins fabricated in record time. That our farmers may not wait for research workers to produce perfect tools but will themselves innovate and find a solution to a pressing need was shown by the Bihar farmer, Shri Ram Prasad Chaudhary Jaiswal of the village of Lalpur who first put up a bamboo tube well in the Saharsa district. Farmers who learnt the economic value of good management in wheat also took to better practices in rice, potato and other crops, with the result that agriculture as a whole started moving forward in such areas. The sudden and steep spurt in fertilizer demand is an eloquent testimony to the credibility of the new varieties and techniques. The concept that agricultural advance in India would suffer due to the limited vision of the farming community was thus



Crushing Sugar Cane

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disproved. The social tensions between those who had access to the inputs needed for adopting the new technology and those who did not have similar access, only underlined the fact that those who have not derived economic benefit from such technology are equally anxious to take to the technology. The desire to change farming methods thus fanned both joy and sorrow in our countryside. This in turn generated considerable thinking and action on the part of Government, resulting in programmes for marginal and small farmers, expansion of credit facilities and more recently in integrated farmers' service societies on the lines recommended by the National Commission on Agriculture.

Assets and Liabilities

Thus, starting from the mid-sixties we have gone through waves of pessimism and optimism. We have been happy over good seasons and more than alarmed by bad ones. Soon we will be a nation of 600 million and it is probably time that we look at our agricultural assets and liabilities critically and scientifically and evolve a pattern of growth which would help us to take full advantage of good seasons, be prepared for the worst and make agricultural growth yield more income and more jobs in addition to more food. This is an appropriate time to undertake such a review since, thanks to one of the best *kharif* harvests we have had so far, we can afford to stop concentrating on holding operations and divert our attention to constructive programmes. Complacency at this stage and any relaxation of relentless efforts to achieve agricultural advance would be disastrous.

I would like to deal with our agricultural assets first.

Assets

Sunlight, soil, water, plants, animals and human beings constitute the basic resources of agriculture. Fortunately, sunlight is abundant except during limited periods in the monsoon season and generally does not constitute a limiting factor in production. In arid and semi-arid areas, the intensity of solar energy

is fairly high and exceeds 650 cal/cm²/day. Under such conditions evapo-transpiration rates become high. The average annual values of energies available in peninsular and north India are 473 and 460 cal/cm²/day respectively. Apart from the use of sunlight by plants in the process of photosynthesis, solar energy is used in rural areas for purposes like drying of crops and grains, distillation, evaporation for salt production and heating. There is however, considerable scope for improving the use of sunlight both by plants, through multiple cropping, and by converting solar energy into thermal energy.

Out of our total geographical area of 328.05 million hectares, the net area sown during 1969-70 was about 139 million hectares. Forests occupied about 65 million hectares and uncultivated land was about 101 million hectares. Thus, the net sown area under crops in 1969-70 was 45.5% of the reporting area and the area under forests was 21.3%. The net national product was Rs. 34,253 crores during 1970-71 at current prices and Rs. 18,876 crores at constant 1960-61 prices. At 1960-61 prices, the contribution of agriculture, forestry and fishing to net national product in 1970-71 was 44.4%. The contribution of agricultural products to the total export earning in the same year was 37.1%.

Diversity in Physiography

The physiography of our country shows great diversity. On the one hand, we have major mountain ranges with the Himalayas, at once one of the youngest as well as the mightiest of the world's mountain systems, in the north and the Aravallis, the Vindhya, the Satpuras, the Eastern and Western Ghats and the north eastern ranges including the Garo, Khasi and Jaintia hills in the other parts of the country. Plateaus, ranging in elevation from 300 to 900 metres, constitute a prominent feature of our topography, the well-known among them being the Malwa, the Vindhya, the Chhota-Nagpur, the Satpura, the Deccan, Ladakh and Meghalaya. A very large part of the country consists of extensive plains watered by great rivers where a considerable proportion of humanity live. In the

rivers originating from the Himalayas, the dry weather flow is generally good due to water coming from melting snows and glaciers. The lean period for these rivers is the winter months but at no time is the flow so reduced as in the peninsular rivers. The flow in the rivers of peninsular India undulates heavily, with big discharges during the monsoons followed by low discharges during the rainless months. Variations of the order of 1 to 300 in the mean monthly flows of these rivers are common.

Our climate shows equally great diversity, ranging from continental to oceanic, from extremes of heat to extremes of cold, from extreme aridity and negligible rainfall to excessive humidity and torrential rainfall. The Himalayas present a barrier to the influence of cold winds from Central Asia and give the sub-continent the elements of a tropical type of climate. The variations in rainfall, temperature and humidity caused by the incursion of comparatively cool currents from the Indian Ocean across the Bay of Bengal and the Arabian Sea and by the movement of shallow depressions, which originate outside India, to the west, lead to extremely complex weather patterns, which prevail even over those areas which can be grouped climatologically under a single type. Thus, temperature, rainfall and the amount of vapour in the air, which influence greatly the growth of crops, show wide variation even within small areas.

An interesting feature of wind system over the Indian Ocean and the adjoining sea and land areas is the seasonal reversal of the Monsoon. During the late summer, the winds flow from the south-west over the sea towards India and Burma, while during the winter, the flow of currents is from India and Burma over the Bay of Bengal and the Arabian Sea towards the Equator. The south-west monsoon season is responsible for over 80 per cent of the total rainfall in most parts of the country.

On an average, we receive an annual rainfall of about 370 million hectare metres. It has been estimated that about 80 million hectare metres seep into the soil of which about 43 million hectare metres remain in the

top layers and contribute to soil moisture which supports crop growth. The ground water recharge available for utilisation may be of the order of 26.75 million hectare-metres, while the current utilisation is about 10 million hectare metres. As a result of the various major, medium and minor irrigation projects undertaken, the area under irrigation during 1969-70 was 30.3 million hectare. The Second Irrigation Commission has calculated that the ultimate potential for irrigation from conventional sources is 81.7 million hectares. It is premature to guess what the contribution of weather modification and desalination will be in the future to augment water availability in drought-prone areas. The States which have less than 15 per cent of the net cultivated area with irrigation facilities are Mysore, Madhya Pradesh, Maharashtra, Gujarat and Rajasthan. Much of the knowledge we have on ground water resources is confined to the alluvial and semi-consolidated areas, whereas 70 per cent of the total geographical area of the country is covered by hard rock. The geo-hydrological studies carried out by the Geological Survey of India as well as the studies carried out under the auspices of the Central Ground Water Board have revealed great opportunities for scientific ground water exploitation. Fresh ground water has been found in the heart of the great Indian desert near Jaisalmer, in the Narmada and Purna Valleys, the Rajamundry and Tirupati sand-stone areas of Andhra Pradesh and the Cuddalore sand stone and the Neyveli lignite areas of Tamil Nadu, in addition to the already well known areas of Punjab, Haryana, Uttar Pradesh, Bihar, West Bengal and Assam. Opportunities for lift irrigation from perennial streams and rivulets are also yet to be fully utilised.

With the growth of vegetation and evolution of agriculture, what were once geological deposits got gradually converted into soils. The topography, biology, physics and chemistry of soils provide an interesting account of past history of that soil. In particular, they indicate the extent of interest taken by man in the care and maintenance of soil fertility and productivity. Examined

by such criteria, our record is dismal.

Our major soil groups

We have four major groups of soils—alluvial, black, red and laterite, several other types like forest, desert, alkaline, saline and acidic soils occurring in smaller areas. The red soils occupy 72 million hectares and are found in both high and low rainfall areas. The stored moisture of a saturated red soil profile is generally sufficient to support a standing crop only for 2 to 4 weeks. Hence mostly *kharif* crops are raised in such soils. Red soils are generally low in nitrogen, low to medium in phosphorus, and medium to high in potash. Drainage is not usually a problem in such soils and hence they can be converted into irrigated land without difficulty, if a water source is available.

Black soils which occur in about 64 million hectares are variable in depth and are generally found in regions with an annual rainfall ranging from 500 to 1200 mm. While in the shallow black soils, only *kharif* crops are grown, *rabi* crops are raised in the deeper soils with residual moisture. Drainage and erosion are serious problems in such soils and hence there have to be appropriate arrangements for drainage and soil conservation, when such soils are brought under irrigation. Black soils contain 40 to 60 per cent of clay and are plastic and sticky when wet and very hard when dry. They contain a high proportion of calcium and organic matter, magnesium carbonate, considerable iron and fairly large quantities of magnesia, alumina and potash. In black soils derived from ferruginous schists, there is generally a layer rich in nodules of 'kankar' formed by segregation of calcium carbonate at lower depths. The most important difference between the red and the black soil lies in the amount and type of clay mineral present. The montmorillinitic type of clay predominates in the black soil and this imparts the characteristic swelling and shrinking properties of these soils. On the other hand, the non-swelling kaolinitic clay predominates in the red soil. The black soils, known as 'grumosol', 'regur' and 'black cotton soils', have self-mulching properties, the repeated wetting and drying causing clods

to crumble into small aggregates forming a surface mulch. These soils are also referred to as being 'self-swallowing', since the surface mulch falls into the deep cracks and thus becomes incorporated into the sub-soil. Thus, on the one hand the black soils have a good capacity for conserving soil moisture and on the other, they need proper tillage and management to overcome the handicaps of their bad structure.

Alluvial soils occupy an area of about 64 million hectares and are generally deep and variable in structure, ranging from drift sand to loams and from fine silts to stiff clays. The main characteristics of these soils are derived from their having been deposited as silt by the rivers, particularly those of the Indo-Gangetic and the Brahmaputra systems. The physical characteristics and nutrients status of these soils vary considerably. In the south, for example, the Godavari alluvium is rich in lime, phosphates and potash, while the Cauvery alluvium is relatively poor in plant nutrients. In Assam, the old alluvial soils are acidic, while the new alluvium is usually neutral or alkaline. In West Bengal, the old alluvial areas are much less fertile and productive than the new alluvial soils.

Hard pans occur in the soil profile, particularly in the Indo-Gangetic alluvium of Uttar Pradesh, Punjab, and Delhi as a result of infiltration of silica or calcareous matter and the presence of 'kankar'. Such hard layers impede root growth and percolation of water. In general, alluvial soils are ideal for irrigation and ground water exploitation.

In about 13 million hectares, we have laterite soils, generally associated with undulating topography in regions with annual rainfall ranging from 1200 to 3000 mm. They are essentially composed of a mixture of the hydrated oxides of aluminium and iron with small quantities of manganese oxide and titania. These soils are poor in lime and magnesium and deficient in nitrogen. Generally, they are poor in available phosphorus and calcium and have a relatively low organic matter content. Such soils are well-developed on the hills of the Deccan, Mysore, Kerala, Tamil Nadu, Madhya Pradesh, Eastern Ghat region,

Orissa, Maharashtra and parts of Assam. The high and low level laterites of Tamil Nadu and Kerala are rich in plant nutrients, supporting paddy in the low levels and tea, coffee, rubber and cinchona at the higher levels. The higher the altitude, the more acidic is the soil. There is a good potential for exploiting ground water in many lateritic areas.

In addition to these major groups of soils, we have problem soils suffering from salinity and alkalinity in about 7 million hectares. There are also peaty saline soils called 'kari' soils which are heavy black soils, highly acidic and rich in organic matter. Marshy soils occur in the coastal tracts of Orissa, the Sunderbans and other areas of West Bengal, north Bihar, the Almora district of Uttar Pradesh and the South-east coast of Tamil Nadu. Forest soils containing a heavy deposition of organic matter derived from forest growth and desert soils occurring in parts of Rajasthan, Gujarat and Haryana, constitute the other important groups.

The main rivers of the Indo-Gangetic plains have extensive areas lying adjacent to them known as *khadir* in western and central Uttar Pradesh, *diara* in Bihar and eastern U.P. and *char* in West Bengal. The soils of these areas range from unconsolidated sand to silt and are rich in potash but low in phosphorus. Different management procedures are needed for the sandy, water-logged, saline and good areas of the riverine soils of Bihar, Uttar Pradesh and West Bengal. In U.P. and Bihar alone, such area extends to about 2.4 million hectares and these are potentially high production soils.

We have also rich rock phosphate deposits both in north and south India and phosphorus rich sands on the beaches of Laccadive, Minicoy and related group of islands in the Arabian Sea. Gypsum deposits are available in Rajasthan.

Floristic Diversity

Consequent on our varied soil and climatic endowments, we have over 20,000 plant species occurring in our country, a number which is far higher than those found in countries with a larger land mass. Such a

floristic diversity is obviously the consequence of the prevalence of tropical, sub-tropical, temperate and alpine areas, where the precise flora may vary depending on latitude, altitude, variation in mean annual day and night temperature and the severity of summer and winter. We have over 4,000 woody species of plants and among them about 50 are of major utility. The potential productivity of our forests has been estimated to be of the order of 490 million cubic metre of wood. The current annual harvests comprising 12.9 million cubic metre of fuel wood and 8.9 million cubic metre of industrial wood are, however, extremely low, the gross revenue being only Rs. 21.50 per hectare.

Our wild plant wealth, used in various forms by people in tribal areas, includes about 500 species, mainly belonging to the families Gramineae, Orchidaceae, Papilionaceae, Rubiaceae, Euphorbiaceae, Moraceae, Compositae and Labiatae. If we total up plants under cultivation on some scale, their number comes to about 250, excluding the ornamental trees, shrubs and herbs. It is believed that about 35 of these species might have been first domesticated in India and our neighbouring countries. There is a large genetic variability in our country in crops like rice, sugarcane, mustard, *arboreum* or Asiatic Cotton, *tossa* jute, various pulses, vegetables such as brinjal, cucumber, gourd, yam, black pepper, cinnamon, turmeric, mango, banana, citrus, jack fruit, *ber*, *phalsa*, *amla*, and *jamun*. Even in plants introduced from the New World, considerable variability appears to have been generated subsequent to their arrival in India. A few examples are maize, chilli, potato and cucurbits. We have areas in the country like the North-Eastern Himalayas, which have very rich variability in crops like rice, maize and *Citrus*. A unique type of *arboreum* cotton with long bolls occurs in the Garo hills. There are trees of mandarin oranges in the Jowai area of Meghalaya which have been productive for over a century. The Jeypore tract of Orissa is also a centre of considerable variability in rice, while in central India, there is vast variability in

several pulse crops. It is only recently that serious attempts have been made to domesticate some of the medicinal plants which are otherwise directly collected from the wild state and used.

An example of such a recent domestication is the release for cultivation in the Bangalore area of strains of *Dioscorea floribunda*, a plant native to Central America and which contains Diosgenin, a steroid used in oral contraceptive pills.

Impressive Animal Wealth

Equally impressive is our animal wealth. According to the livestock census of 1966, our total livestock population was 344 million including 176.0 million cattle and 53 million buffaloes. Both in cows and buffaloes, we have an impressive array of hardy and productive breeds. Exotic breeds like Holstein, Brown Swiss and Jersey are being increasingly used in cattle breeding programmes. More than 60 per cent of the total milk production comes from about 23.4 million buffalo cows. The best dairy animals in our country have, however, an average production efficiency of only 25% of their counterparts in Europe and North America.

We have about 4.2 per cent of the world sheep population, numbering according to the 1966 census about 42.0 million. In addition to wool, mutton and milk, sheep contribute at present 15.5 million pieces of skins and 2.1 million tonnes of manure. Sheep abound in semi-arid and arid areas and both the hot desert of Rajasthan and the cold desert of Ladakh offer great scope for sheep and goat improvement. Our poultry population is equally high, having been estimated at 115 million in 1966.

Animals also contribute over 28 million H.P. of energy per day for agricultural operations. Good animals found in states like Punjab, Haryana, Andhra Pradesh and Tamil Nadu may give about 1 H.P. per pair per day of 8 hours, while those in the eastern states may give only half as much. It has been calculated that to produce a yield of 2 tonnes per hectare, the average power requirement would be about 0.75 H.P. per day. The current power

availability including those provided by man, animals, tractors and power tillers comes to only 0.30 H.P. per hectare. Thus, inadequacy of power is one of the basic causes for our inability to improve the efficiency of farming through timely agricultural operations.

Marine Fisheries

Fisheries, both marine and fresh water, constitute one of our great assets. Over 3 million persons live on marine fisheries and the gross annual revenue to the country from fisheries is over 300 crores of rupees. Our marine fish catch has increased from about 4 lakh tonnes in 1947 to about 1.2 million tonnes in 1971. We are now the second biggest shrimp producing country in the world and the export of seafood during 1972 earned for the country over Rs. 60 crores. The estimated potential catch from the western Indian Ocean is about 8.9 million tonnes consisting of 4.4 million tonnes of pelagic fishes and 4.5 million tonnes of demersal fishes including prawns and other crustaceans. The potential catch from

the eastern Indian ocean is about 5.5 million tonnes which includes 2.4 million tonnes of pelagic fish and 3.1 million tonnes of demersal fish. Another index of the untapped marine fish resources we have is provided by comparative figures on catch in different oceans. The yield per sq.km. is about 233 kg. in the Atlantic Ocean and 196 kg. in the Pacific Ocean, in contrast to 37 kg. in the Indian Ocean. Even out of this low yield, we catch very little. For example, the total tuna catch from the Indian Ocean is about 175,000 tonnes, out of which our share is about 5,000 tonnes. The rest is caught mainly by Japanese, Korean and Taiwanese vessels.

Though the current contribution of inland fisheries, including both capture and culture fishes is low and amounts only to about 690,000 tonnes per year, there is vast scope for improvement through modern aquaculture techniques. Water pollution and water weeds could become some of the greatest threats to fish culture and hence deserve serious attention. Domestic and municipal wastes contribute more

in many areas to pollution, than industrial effluents.

Any account of our agricultural assets will be incomplete without a reference to the excellent network of agricultural universities, research institutes and demonstration-cum-training centres which we fortunately have. A recent analysis at the Yale University has shown that while investment in agricultural research has been very small in many parts of India in relation to other sectors of research, the payoff from investment on agricultural research in our country has been one of the greatest in the world. Among factors which have contributed to the effectiveness of our agricultural research system is the development by the Indian Council of Agricultural Research of a national grid of co-operative experiments conducted by scientists belonging to all the relevant disciplines and institutions. Such all-India co-ordinated research projects now number over 70 and cover all the major areas of crop, animal and fish improvement. The data collected in such projects are discussed at all-India workshops and decisions on recommendation to development agencies and farmers are made collectively by all the concerned scientists. Another important strength of our research system is the direct linkages which have been established between the research centres and the farmer through National and mini-kit demonstrations, Krishi Melas and travelling seminars. This feed back relationship assists in the fine tuning of the research apparatus to the needs of its clients. Though impressive in terms of contributions, our research efforts are still very small in relation to the magnitude and diversity of problems facing us.

I shall now turn to some of our major liabilities.

Liabilities

The low productivity of our agricultural systems is well-known and comparative statistics place our country in the bottom group with reference to the yield per hectare of many economic plants like rice, wheat, *Jowar*, maize, pulses, oilseeds and cotton. An important reason for our relatively poor agricultural prod-



Fishermen returning with their catch

Barnaby's Picture Library

activity is the vast area under the important crops, which includes considerable marginal lands. Historically, cropping systems have evolved partially due to ecological and pest and disease compulsions but more importantly, on the basis of the home needs of the farmer and his family. We now know that many low-yield environments for rice or wheat may constitute high-yield environments for some pulse or oilseed crops. An effective food distribution machinery can pave the way for re-adjustments in crop planning based on considerations of ecology and economics. If this is not done, our agriculture will become increasingly inefficient and expensive and our cost of production will increase, since wages tend to rise with or without co-incident improvement in productivity. For example, our average rice yield now is about 1170 kg. per hectare and if the tentative Fifth Plan projection of productivity improvement is all that we can achieve, the average yield will be 1375 kg/ha by 1979. In contrast, the average yield of rice even in 1971 was over 5000 kg. per hectare in the Arab Republic of Egypt, Japan, Italy, the United States and several other countries. Thus, after the inadequacy of farm power, a major handicap is defective land and water use resulting in low yields.

Probability Estimates

I mentioned earlier that one of our great natural assets is variability in weather and soil conditions which fostered the domestication of a wide range of economic plants and animals. Aberrations in weather, however, also constitute a major handicap. The rainfall distribution is skewed, about 80% occurring during the south-west monsoon season. About 30% of our geographical area receives annually less than 75 cm. rainfall and the occurrence of drought, floods, breaks in monsoon, cyclonic storms, thunderstorms and duststorms are common in one part of the country or the other. Although the periodicity of such weather aberrations cannot be determined with precision, it is possible to work out anticipatory measures and cropping systems on the basis of probability estimates. This is yet to be done systematically.

The next major handicap is the growing loss of soil and the damage that is being done to soil health and fertility. For reasons which are not clear to me, there has been a great neglect of the soil in our country in comparison with China or Japan. While it takes anywhere between 100 to 400 years for one centimetre of top soil to be formed in nature, all this soil can be lost in just one year due to erosion. It has been estimated that nearly 80 million hectares out of the 139 million hectares under cultivation require attention from the soil conservation point of view. A wide range of factors such as denudation of forests and vegetation cover, inappropriate tillage and cropping techniques and practices like shifting cultivation, are causing a considerable loss of valuable soil through water and wind erosion.

Shifting cultivation, known as *Jhuming* in the north-eastern Himalayan region, involves cutting down all vegetation from hill slope, use of fire to clear the debris, growing a crop like a hill paddy, millets, sweet potato or beans, abandoning the land after a few years and restarting the cycle at another place. According to an FAO estimate, this form of cultivation dates back to the Neolithic period. While this practice has gradually tended to disappear from States like Bihar, Orissa, and Madhya Pradesh, the area cleared annually for *Jhuming* may be about 100,000 hectares in Assam and Meghalaya. Observations in Assam hills, indicate that at least 10 centimetres of soil may be washed away even from moderate slopes in each *Jhuming* cycle. One of the factors influencing such indifference to soil care is the fact that the land cleared for *Jhuming* is not owned by the cultivator, whose interest in the land is co-terminous with the cropping cycle. Shifting cultivation as well as growing one crop once in two to three years were two of the ancient methods of overcoming the implications of the law of the diminishing return of the soil in relation to crop yield. In areas with settled cultivation, application of organic wastes and the cultivation of pulse crops and other legumes which can fix atmospheric nitrogen in the soil were the common methods of re-

FROM
METHUEN

Why Soft Technology?

Alternative solutions to the energy crisis.
ANDREW MACKILLOP

The ecology crisis and the politics of decentralization, together with the recent 'energy crisis', have sparked off in people's minds a new awareness that the fundamental needs of food, energy and shelter can be met in simpler, more natural and more ecological ways. From this has come a search for a new technology — soft technology.

This pamphlet explains the underlying philosophies of the new technology, and illustrates the ways in which such things as solar heat, methane gas and wind power can be utilized in an ordinary urban setting to make self-sufficiency a realizable goal.

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65p

storing soil fertility adopted in the past.

Soil Conservation

Soil erosion leads to an enormous loss of nutrients. Some calculations show that the annual loss of soil due to erosion is about 6,000 million tonnes and that of nutrients is 2.5 million tonnes of nitrogen, 3.3 million tonnes of phosphorus and 2.6 million tonnes of potash. A portion of these nutrients may get deposited elsewhere. In fact, such loss of nutrients may be the most important cause of water pollution in our country. A major approach to soil conservation has been the construction of contour bunds for the purpose of decreasing erosion, conserving water above the bund and increasing infiltration. We have so far treated, during the various Plan periods, about 13.3 million hectares of agricultural land and 1.2 million hectares of non-agricultural land with various soil conservation measures. While these programmes have been very valuable both for

diminishing erosion and providing employment, the agricultural benefits from such programmes have not been commensurate with the effort or expenditure involved. Often bunding has neither been followed up with other measures like providing a vegetation cover nor has it been carried out with an understanding of crop production technology. For example, a recent survey by the Madhya Pradesh Department of Agriculture on the effectiveness of contour bunds in increasing *rabi* wheat yields has shown that on the whole the effect of bunding was strongly negative. Similarly, a study on the effect of bunding on the yield of *kharif* crops in the Bellary area indicated that contour bunding decreased the yields of *jowar*, cotton and safflower both as a result of water stagnation and delay in cultural operations. It is obvious therefore that soil conservation measures need to be planned and implemented in a much more scientific manner taking into consideration not only the need to check erosion, but also the end purpose of promoting crop growth.

One has only to see how land is being used for brick making and road making in our country to understand the extent of indifference to the care of the soil. While planned use of land for brick making could help in building up permanent assets like tanks, unplanned use results both in the loss of good agricultural land and in erosion. Similarly, there is always a danger that natural drains may be plugged if a total view on soil and water conservation is not taken while planning the construction of roads and railway lines. Closing natural drains leads to floods and thereby to considerable soil erosion. Thus, deforestation, shifting cultivation, overgrazing and improper cropping of undulating lands, bunding without vegetation cover, plugging of natural drains and other kinds of poor land management are causing increased runoff, reduced ground water recharge and severe erosion resulting in the deterioration of soil, loss of valuable nutrients, lower yields, flooding of lowland areas, sedimentation of small tanks and large reservoirs and the wastage of

precious water to the ocean. It is not hence surprising that in an article entitled *The Eleventh Commandment*, Dr. W.C. Lowdermilk stated a few years ago that "the use of land is a down-to-earth index of civilization, for land has been the silent partner in the rise and fall of civilizations".

We can continue to neglect our soil only at the peril of our future. The authors of *Limits to Growth* have calculated that every child born today would need 0.08 hectare of land for purposes like housing, roads, waste disposal, power supply and other uses and 0.4 hectare of land for producing the food he or she needs. On this formula, we will need at least 5 million hectares of additional land every year to cater to the needs of those added to our population. In contrast even in 1969-70, the availability of agricultural land was only 0.34 hectare per person. Obviously, it is time we woke up and spread throughout the country a consciousness of the value of soil and the importance of scientific land use.

Improper and inefficient water use, inadequate tapping of sunlight, poor utilisation of biological nitrogen fixation, wasteful disposal of wastes, lack of understanding of recycling processes and poor integration of crop and animal husbandry on the one hand, and terrestrial and aquatic production systems, on the other, are some of our other major liabilities.

The slow pace of progress in getting the best out of our water resources is evident both from the relative stagnation in *kharif* crop production and the low intensity of farming. During the *kharif* season, when much of the rainfall is received, the production of foodgrains was 65.6 and 62.0 million tonnes in 1964-65 and 1971-72, respectively. In contrast, the *rabi* production during these two years was respectively 23.7 and 42.7 million tonnes. Thus, our major gains in production have come from the non-rainy season. With the development of irrigation facilities it should have been possible to bring more area under double and multiple cropping. The intensity of cropping is however

still low, and has risen from 114 per cent in 1965-66 to only 117 per cent in 1969-70.

A low intensity of cropping when water is available also implies a poor utilisation of sunlight, since in the tropics and sub-tropics green plants can be made to produce food, feed and fodder continuously by photosynthesis from water and atmospheric carbon dioxide. The cellulose produced by photosynthesis on the earth is not only the chief basis of all fossil fuels, but is also the most abundant renewable raw material currently available.

Nutrient Supply

In the area of nutrient supply to crops, organic manures like farmyard manure, compost, green manure, various oil-cakes and various waste products of animal origin like dried blood, bones, fish manure and urine have been used in the past. With the growth in population, farmyard manure and other organic wastes have increasingly been diverted to fuel purposes. Though some work has been done on the generation of gas from such wastes in order to obtain both fuel and manure from the same material, such techniques have not come into use on any significant scale. Much of the urban wastes, sewage water, cattle and human urine and human excreta are not recycled in a manner that will promote productivity.

A great marvel of nature is the way in which micro-organisms fix atmospheric nitrogen in the soil largely through leguminous plants. While synthetic nitrogen-fertilizer production requires very high temperature and pressure for combining nitrogen, hydrogen and oxy-



Forest of dead trees in Rajasthan

Photo: Edward Goldsmith

gen, the nitrogen-fixing organisms like *Azotobacter*, *Rhizobium*, and blue-green algae are able to do this at ordinary soil temperature and pressure, with the help of the enzyme nitrogenase. Nitrogen is now being introduced into the earth in fixed form at the rate of about 92 million tonnes per year, whereas the total amount being denitrified and returned to the atmosphere is only about 83 million tonnes per year. The difference of 9 million tonnes per year may represent the rate at which fixed nitrogen is building up in the soil, ground water, rivers, lakes and oceans. Unfortunately, studies show that while Australia, the United States and Soviet Union are adding every year substantial nitrogen to their soils, we have a negative nitrogen balance to the extent of 8.2 lakh tonnes per year.

Before I end this discussion on our agricultural assets and liabilities, I must refer to the most important factor which will determine our agricultural future, namely, our human population. The principal characteristics of our population are the predominance of youth, poverty, under-nutrition and illiteracy. According to the projections of the Registrar General, we will have about 657 million people by 1981; over 40 per cent of them will be below the age of 18. Nearly 80 per cent of our population lived in villages during 1971. We are thus mainly a land of youth and of rural people. Impressive statistics on poverty are available and there is also a growing awareness of the implications of protein-calorie malnutrition on national development. Many authorities now compare nutrition education respectively to the hard and soft ware components of technology. Although in terms of percentage, the number of literates rose from 24.03 in 1961 to 29.34 in 1971, the number of illiterates increased in absolute number during this period. Most of our agriculture is managed by illiterate peasantry and Mahatma Gandhi warned us forty years ago that unless there was a marriage between intellect and labour in rural India, there would be neither agrarian advance nor rural prosperity. Our agricultural future will hence depend to a great



Photo: Edward Goldsmith

Camels removing Rajasthan's remaining trees

extent on how successful we are in involving youth and the illiterate, both men and women, in rural transformation. The urgency of population stabilisation hardly needs any emphasis, since all our efforts will have no effect in improving the quality of life, if population growth cannot be arrested and stabilised.

The second class compartment of Spaceship Earth is getting smaller and smaller, while the number of those who have to live there is getting larger and larger. Affluence is becoming a major claimant of world food and energy resources. Between 1967 and 1971, the developed market economies increased their agricultural exports on an average by 11 per cent per year, while the developing countries lost ground by 1 per cent. This is the net result of what is called the U.N. Development Decade. It is time the people living in the first class compartment realised that when the compartment of the poor bursts due to excessive pressure, the whole spaceship will crash. But the poor have to begin to help themselves.

During the last few years, we have started making real progress in improving our agricultural capability. While food production dropped by 17 million tonnes during the drought of 1965-66, the fall in production during the drought of 1972 is likely to be less than half of this amount. This is certainly an index of real progress and encouragement for greater effort.

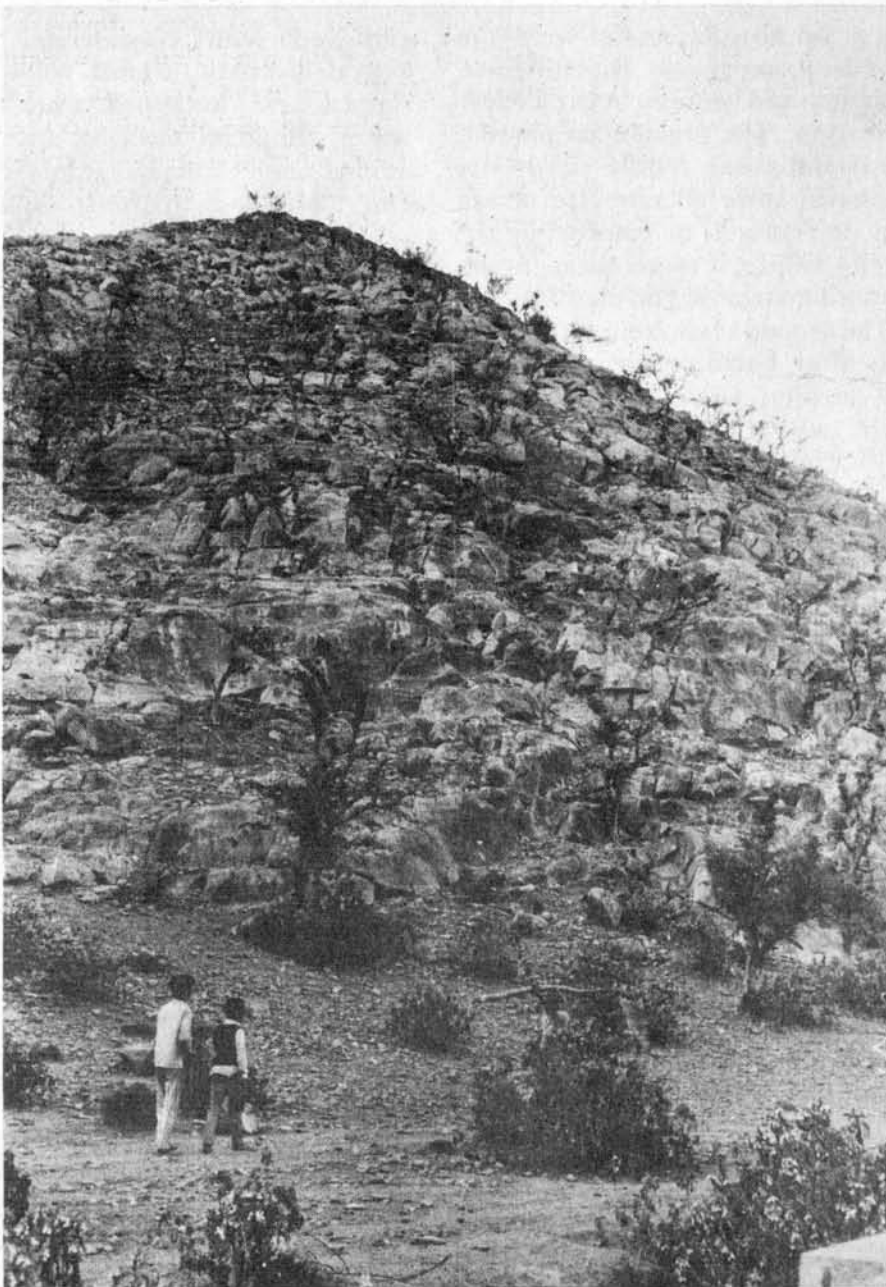
To summarise the state of our agricultural balance sheet, we are

endowed with considerable ecological diversity, a large volume of tapped and untapped sources of water, abundant sunlight, and large animal and human populations. Our liabilities, apart from those caused by population growth and aberrant weather, mostly arise from an improper use and management of these resources. Attempts to promote synergy, which is the only mechanism which can lead to rapid progress from small resources, have been few and halting. Our urgent needs hence are first, to develop and introduce in each ecological area an agricultural production technology which will lead to increased productivity based predominantly on the use of renewable resources and on the wise husbanding of non-renewable resources. We will have to learn to produce more and more food from less and less land. Secondly, we need to develop and introduce educational tools which will help to impart the latest technical skills to illiterate peasantry and which will enable educated youth to become catalysts of rural change. Finally, we need to develop and spread management and organisational techniques which will help those living in absolute poverty to overcome their handicaps and obtain their share of the fruits of agricultural advance.

From a paper given at the Indian International Centre, New Delhi, October 1975.

A Policy for Land

by B. B. Vohra



Hills recently deprived of topsoil by water erosion caused by overgrazing and deforestation.

Substantially more than half our 580 million people exist below the line of poverty — a level of destitution and privation that cannot be even imagined by the more affluent people of the world. Yet we are increasing the numbers at the rate of around 13 millions a year and are expected to exceed the 1000 million mark by the end of the century. What are the prospects of our being able to improve the lot of even the present population, let alone the additions which time will make to it?

2. In a situation where more than two-thirds of the population derive their living from agriculture, and where this industry accounts for nearly 50 per cent of the GNP, the answer to this question clearly depends on how good a use we make of the land and soil (and therefore also of the related water) resources which are available to us. For it is these resources which in the last analysis constitute the basis of all agricultural, animal and forestry production and determine the level at which our people are sustained. It cannot be denied that we have failed to make the best possible use of these resources thus far — had we done so, we would not have been in the sorry plight in which we find ourselves today. Paradoxically enough, however, it is this very fact of our past neglect of our natural resources which offers the greatest hope for the future — assuming, of course, that we can bestir ourselves while there is still some chance of winning the race against time.

3. Visual evidence of our neglect of the soil is available wherever one might go in this huge country of ours. Denuded hillsides, ravines, waterlogged and saline areas, drought-stricken villages, silted-up tanks and drying wells are to be encountered almost everywhere. Floods ravage large areas year after year even as the Rajasthan desert maintains its leeward creep. In certain coastal areas, particularly Kerala, erosion by the sea is a major problem. In the north eastern parts of the country shifting cultivation continues to strip once heavily forested slopes of all vegetations.

4. In quantitative terms, around 140 million hectares — out of a total geographical area of 328 million hectares — are seriously affected

Photo: Edward Goldsmith

by erosion by wind or water, about 7 million by waterlogging and salinity in non-coastal areas alone and another 20 million or so by floods — a total of 167 million hectares which need protective and ameliorative treatment to stop the further depletion of our soil resources. However we must also take note of the 20 odd million hectares of canal irrigated lands which are today being utilised only to a fraction of their potential because of the wastefulness and inadequacy of distribution systems and the lack of proper arrangements for draining away excess water and for the levelling and shaping of fields so as to enable them to be irrigated efficiently. This makes a grand total of 187 million hectares which require attention if they are to improve their productivity.

5. It is not possible to easily compute, in terms of money, all the losses suffered by the community as a result of this situation. Nevertheless certain estimates are available which show how colossal these losses are. Thus, it has been estimated that soil erosion causes the displacement of around 60,000 million tonnes of fertile top soil every year — top soil an inch of which it takes nature between 500 and 1000 years to build and which has been estimated to contain nutrients of the order of 5.37 million tonnes of NPK and of the value of around R⁵.700 crores. A great deal of this soil finds its way to the sea but a good deal of it also gets lodged in irrigation tanks, reservoirs and river beds. A rising of the level of river beds due to sedimentation is a major contributory cause of floods which on an average take a toll of about R⁵.300 crores every year by way of damage to crops, animals, habitations and communications. Sedimentation causes the loss of storage capacity in minor surface irrigation works which is equivalent to the potential created by an annual investment of R⁵.50 crores. The damage done to major reservoirs has not been computed but it is very serious indeed — the average rate of sedimentation observed is several times greater than the rate which was assumed at the time that they were designed and built. This means that the life of

the irrigation and multi-purpose projects on which the community has invested around R⁵.3500 crores is being seriously shortened.

6. It is impossible to estimate the value of the groundwater which is being lost on account of the excessively fast run-off of rain on denuded slopes. However, the money spent on the relief of the victims of droughts has been of the order of over R⁵.150 crores a year during the last Plan. The rate at which good lands are going out of production on account of waterlogging and salinity is not readily available but the value of the 7 million hectares which have already been lost in this way is in the region of R⁵.10,000 crores. To these losses must be added those which we are incurring by failing to put our tens of millions of so-called waste lands to work — so called because it has been demonstrated that even the Rajasthan desert can be made to grow grasses and trees if given proper attention

It has been estimated that soil erosion causes the displacement of around 60,000 million tonnes of fertile top soil every year.

against over-exploitation by man and beast. Finally we must also take into account the additional production which it is possible to obtain from canal-irrigated areas under optimum conditions of soil and water management.

7. It will be clear from the above that the penalty which we are paying for the neglect of our land and soil resources is of colossal proportions in terms of money alone, not to speak of the acute human distress and suffering involved. This is not a situation which we can afford to ignore any longer, but one which we must try to remedy as quickly as we can. For what is involved is nothing less than the question of

our very survival. We have no option left but to ensure that every single acre of land yields the maximum that it is capable of, whether this be in the form of crops, or trees or grasses. We must jealously protect our good arable lands against depletion in area or fertility, vigorously arrest the further degradation of marginal lands and carefully nurse ailing soils back into health and productivity.

8. The cost of executing a programme for containing the threats posed to the soil by erosion, floods, waterlogging and salinity and for making the optimum use of our canal-irrigated areas, was estimated* about two years ago to be around R⁵.20,000 crores at the price levels which were then prevalent. The corresponding figure corrected for 1974 prices would be perhaps something like R⁵.30,000 crores. However, since it will be years — with the best will in the world perhaps not less than 30 years — before such a programme can be completely implemented and since the degradation of the soil and its attendant ills will proceed apace during this period, the final bill of costs may well be around R⁵.50,000 crores at current price levels. This is a staggering bill indeed but we have no choice except to foot it because the alternative is too horrible to even contemplate.

9. What is our present state of preparedness to take up a programme of this nature with any degree of confidence and to bring it to a successful conclusion in about 30 years? It is very poor indeed. In purely financial terms our capacity to execute soil and water conservation programmes, and engineering works for flood control, was no more than about R⁵.100 crores a year at the end of the Fourth Plan. This is a level of investment which bears almost no relationship to the magnitude of the tasks which confront us.

10. However, what is even more disturbing is the fact that the quality of the soil and water conservation work done so far — and on which a total of no more than R⁵.400 crores have been invested since the

* B.B. Vohra "A Charter for the Land" Ministry of Agriculture, September, 1972.

beginning of the planning era — has been far from satisfactory and has therefore resulted in infructuous expenditure of a large order. The causes of this failure have been mentioned elsewhere* in some detail and need not be repeated here. Suffice it to say that such works have failed to produce the results expected of them because they have not been planned or executed on the basis of a complete sub-catchment as a unit, because they have been taken up in a fragmentary manner by a number of organisations acting in isolation of each other, and because they were not supported either by adequate research or by an adequate knowledge of local soils. Maintenance

What is involved is nothing less than the question of our very survival. We have no option left but to ensure that every single acre of land yields the maximum that it is capable of.

and follow-up operations have also been practically non-existent and, in the case of afforestation schemes, protection has been most unsatisfactory. Again, neither the reclamation of degraded soils nor the optimisation of the potential of canal irrigated areas has received much attention so far. A very great effort will have to be made to remove these shortcomings before we can take up work on a big scale during the 5th and subsequent Plans with the assurance that the investment made will not add to inflationary pressures. Not only will we have to

create the multi-disciplinary organisations which alone can take an integrated view of the problems of land management and tackle them effectively but we shall also have to ensure that these are served with adequate resource and research data. Among the other matters which will require attention are the need, on a large scale, for trained personnel and for the vesting of suitable statutory powers in land use authorities at various levels.

11. Since all this will take time to accomplish we need not at this stage be unduly frightened by the size of the final bill. Experience in successive Plans shows that it is always easier to make financial allocations than to ensure that they are utilised to good purpose. One of the most effective ways of ensuring that land management programmes are planned and executed in a responsible manner in the future would be to increasingly insist that they pass the test of economic viability — a discipline which has been very largely missing in the past. For in the final analysis the huge investments envisaged can only be justified if they prove themselves to be capable of attracting institutional finance. If we are to profit from past experience, outright Government expenditure must be reduced to the irreducible minimum.

12. The creation of the administrative, legal, financial and technical infrastructures needed for the successful implementation of a programme of the size and range indicated by the situation which confronts us today is therefore the Herculean task to which Governments both at the Centre and in the United States must immediately bend their energies if the country is to be saved from almost certain disaster. The effort, difficult though it will be, will be rewarding in more ways than one. Not only will it result in the consolidation of the physical base for all types of agricultural production and therefore for the amelioration, if not the eradication, of poverty in course of time but it will also provide almost unlimited opportunities of employ-

ment to the rural poor as well as to technical, skilled and semi-skilled workers.

13. All this is very well but we must ask ourselves a final question — what exactly are the chances of such a programme actually taking shape in the immediate future? The answer to this question will depend on the speed with which a stern political will can be brought to bear on the subject. However, since political will is itself the end product of an informed and strong public opinion in a democracy, and since such an opinion can be hardly said to exist today so far as the subject of good land management is concerned, it would be unrealistic to imagine that it can be wished into existence

It is impossible to estimate the value of the groundwater which is being lost on account of the excessively fast run off of rain on denuded slopes.

overnight. A great deal of painstaking and patient work shall have to be done to wipe out the backlog of ignorance, inertia and complacency which have stood in the way of these matters receiving greater attention in the past. Only when this has been done, and thinking persons in the country made conscious of the issues which are at stake would it be reasonable to expect the necessary political will to generate itself. This then is the immediate task which confronts the leadership of the country today — leadership particularly in the field of ideas, policy making and planning.

* B.B. Vohra, *Op.Cit.*



A Policy for Water

by B. B. Vohra



Drawing water from a village well

A national policy for water must concern itself primarily with the optimum management of the country's renewable fresh water resources, represented by annual precipitation in the form of snow and rain. Since most of this precipitation occurs during the relatively short monsoon season, it is necessary that we must aim at its conservation to the maximum possible extent so that water may be available for agricultural, domestic and industrial uses throughout the year. Since, further, the demand for water is not only already in excess of its supply but is also growing steadily in all sectors, we must make sure that this scarce resource is used with the utmost economy, and to the best possible advantage of the community.

2. Before there can be any meaningful discussion of how these twin objectives can be achieved it is necessary to consider how water behaves during the terrestrial portion of the perpetual hydrologic cycle. For we can make little use of water so long as it is in the atmosphere and none at all once it has re-entered the sea — it is only so long as water remains on or within the land mass that we can use it for our own purposes.

3. Of the precipitation which comes into contact with the surface of the land and does not get evaporated immediately, a portion runs off as surface flow while the rest percolates into the soil. The amount of water which runs off and the amount which passes into the soil and later into the sub-soil strata in the form of groundwater depends upon a number of factors. Broadly speaking, the greater the intensity of rainfall, the greater the slope of the land and the greater the state of denudation, the greater will be the run-off and therefore the lesser the amount of water available to saturate the soil and recharge groundwater aquifers. Further, since all flowing water dislodges and carries away some amount of the top soil, it also follows that the greater the run-off the greater will be the erosive action of water.

4. It is extremely important that these basic facts about the interaction between precipitation and the land surface on which it falls

should be properly appreciated because it is this interaction which holds the key to the understanding of almost all problems of water as well as of land management. For it is as difficult to manage silt-laden waters as it is to manage lands denuded of their top soil and therefore deprived of their rightful share of soil moisture and groundwater.

5. Let us see why this should be so. The vicious circle of erosion has its beginnings in the destruction of the natural vegetative cover of the soil. Once this cover has been destroyed, whether by overgrazing or by the conversion of forest lands into agricultural lands, and the soil laid bare to the fury of tropical rains, it begins to lose its fertility and therefore its capacity to support vegetation. For unlike water, the soil is for all purposes a non-replenishable resource — it takes Nature anything between 500 and 1000 years to build an inch of the fertile top soil. This is why erosion becomes more difficult to control with each passing year, and is accompanied by increasing aridity because denuded land surfaces offer little resistance to run-off.

6. The conservation of the soil is therefore necessary as much for its own sake as for the conservation of water. It is however equally necessary for the prevention of the damage which silt-laden waters cause in a variety of ways. For sediment not only eats into the storage capacity of expensive tanks and reservoirs but also makes the management of rivers an extremely difficult affair. For the carrying capacity of rivers gets reduced as sedimentation in their lower reaches raises their beds and causes them to overflow their banks. Devastating floods and changes in the courses of rivers are thus the direct result of soil erosion. The construction of embankments and dykes for the control of floods is not only an expensive business but offers no permanent remedy since they have to be continually raised in height to cope with the progressive rise in the level of river beds. The deposits of silt near the mouths of rivers choke bays and harbours and create acute problems of dredging and drainage in deltaic areas.

7. It is clear from what has been said above that a sensible water policy should concentrate on the conservation, to the maximum extent possible, of water as soil moisture and groundwater rather than, as is happening now, on the storage of silt-laden waters in gigantic reservoirs and on the construction of expensive works for containing floods which are uncontrollable because they are bound to increase in fury with each passing year if their catchments continue to be neglected.

8. The rich dividends which a sensible water policy — sensible because it takes account of the realities of the relationship between land and water — and is not based on a purely engineering approach — would pay are easy to set out. Precious soil resources would be saved for the community, and floods, which cause losses of the order of Rs.300 crores annually would be reduced in incidence and severity.

**Devastating floods and changes
in the courses of rivers are the
direct result of soil erosion**

The danger posed to tanks and reservoirs — on which thousands of crores have been invested — by sedimentation would be removed. Finally, a great deal of water which is being lost to the sea would be conserved as groundwater.

9. The benefits which additional supplies of groundwater would confer on the community need special mention. For not only does this resource represent water in its purest natural form, but it also costs absolutely nothing to store for indefinite periods and what is more, to convey over the large distances which it travels under the surface of the ground in an effort as it were, to serve the largest possible number of people at their very doorsteps.

Further, it suffers no losses by evaporation or seepage — either during storage or during transmission — such as surface waters are subject to. It is easy to tap as individual tubewells can be installed at little expense and within a matter of weeks if not in fact days. Once developed, groundwater is available as and when required by the user on the mere pushing of a button and therefore lends itself beautifully to the requirements of modern agriculture.

10. By contrast, surface water is extremely difficult to store and manage. Big projects — such as are the vogue in this country — take decades to design and build, require large areas of precious land for submergence and for distribution systems, are subject to serious evaporation and transmission losses, and demand stupendous outlays for their completion. They also create significant problems of waterlogging and drainage and thus pose a threat to the very land they are meant to serve. Their storages are exposed to the threat of siltation and their command areas require large outlays for the full development of their potential. They require large staffs for maintenance and operation but find it difficult to give full satisfaction to the farmer in the matter of supplying water as and when required. Financially such projects are still in the red — the annual losses on their operation are of the order of Rs. 150 crores. But above all, they are wasteful of water — not only do transmission losses amount to around 40% on the average, but since water is generally not charged for on a volumetric basis, the farmer is also extravagant in his use of this resource.

11. For all these reasons, every effort must be made to replenish groundwater resources to the fullest extent possible. Apart from facilitating the natural recharge of groundwater through soil and water conservation measures, efforts must also be made to undertake artificial recharge wherever this is possible. (Thus it would be a good idea to investigate the possibility of diverting the flood waters of the Ganga into the Rajasthan desert — to make use of the groundwater storage

available there — instead of thinking of taking them all the way to the Cauvery.) Conditions must also be created to encourage groundwater development to the fullest possible extent by carrying out land reforms and consolidation of holdings, by undertaking scientific investigations designed to ascertain the limits of safe pumping in given areas, by providing technical advice and guidance to farmers, by arranging for loan assistance on an adequate scale and by making sure that tubewells do not remain idle on account of lack of electricity or diesel. In situations of limited supply of groundwater, statutory powers must also be exercised to regulate development.

12. In an ideal situation, the planning of water conservation and use would be undertaken on a sub-catchment basis, in order to ensure that the water which flows into the main river system from each of its sub-catchments is not only free from silt but is also such as is genuinely surplus to local requirements. The calculation of local requirements would naturally depend upon the land use which is considered to be the best for the area in question and would involve a study of local soils, climatic conditions and available water resources. Arid areas should, in particular, not allow any run off to be lost and must utilise all precipitation locally — whether for growing crops or merely grasses and trees. Protection against over-grazing and over-felling must, in all sub-catchments, be undertaken alongside such measures as contour ploughing, contour terracing and bunding and the construction of gully plugs and detention weirs.

13. It is not difficult to imagine the dramatic change that the implementation of such an approach would bring about in the ecological environment that governs our fate as a nation. The denuded Shivaliks, the ravines along the Chambal, the Jamuna, the Sabarmati and the Mahi would become things of the past, as would the treeless and grassless slopes of the Deccan plateau and the bare hills of North Eastern India which have been stripped of vegetation by imprudent shifting cultivation. The millions of hectares of the so-called waste lands which

yield nothing but silt and floods today would become important producers of grasses and trees and would contribute significantly to the replenishment of the country's groundwater resources. Our rivers would carry less sediment, and thanks to return flows from groundwater aquifers, would maintain more even flows throughout the year. Our storages would acquire new leases of life and the severity of both floods and droughts would be reduced.

14. All this can however become possible only if the management of our water resources is not looked at as a problem of civil engineering but as something inseparable from the total management of our land and soil resources. If this is done, the conclusion will soon be reached that the first task before our irrigation departments today is to make the fullest possible use of the waters which have been already impounded at such heavy cost as this offers the best hope to the

The management of our water resources is not a problem for civil engineering but is inseparable from the total management of our land and soil resources.

country for achieving self-sufficiency in food in the shortest possible time. This is however a task which requires a drastic re-orientation in the attitudes of the irrigation engineer. Instead of dreaming of building more gigantic structures he must learn to pay attention to the detailed requirements of efficient irrigation and undertake the execution of the numberless small works which are required in each command to maximise production, and to prevent the wastage of water as well as damage to the soil. To illustrate, distribution systems need to be extended in a scientific manner over tens of millions of hectares so as to

reach the last field in each outlet command, fields need to be levelled and reshaped in accordance with the contours of the land, and field as well as intermediate and major drainage provided wherever water-logging is or is likely to become a problem. A comprehensive approach to irrigation problems would also induce engineers to take more than a theoretical interest in the protection of reservoirs against siltation and would involve them seriously in soil and water conservation measures in catchment areas. All these are extremely complicated tasks and present a very big challenge indeed. They will also require huge outlays, running into thousands of crores and will take decades to complete. The reconsideration of existing irrigation policies will thus not affect job opportunities for engineers in any way — if anything it will enhance them.

15. The new approach suggested above will also yield some other benefits. By confronting Irrigation Departments with the total costs of projects — costs which include those of command area development and drainage as well as of reservoir protection — and by acquainting them with the difficulties in the way of planning and executing such “total” projects, it will bring them down to earth — both literally and metaphorically — and dampen their ardour for taking up big new projects even while existing projects are languishing. Such a change in attitude will be most welcome indeed and will hopefully cure Irrigation Departments of the disease of gigantism that most of them are suffering from. For today Irrigation Departments think it below their dignity to even look at projects which cost less than Rs. 30 lakhs each — such projects are classified as “minor” and left to Panchayats and Agriculture Departments to plan and execute. Yet it is precisely such “minor” projects which are needed to be constructed in large numbers in the future if better use is to be made of our soil and water resources.

16. The new approach will also end the isolation in which the civil engineer has functioned so far in tackling irrigation problems — problems which by their very nature

require the concerted attention of a number of disciplines. For it will no longer do to consider a project completed if the storage structure is completed and the distribution system built up to the outlet which serves blocks of land of anything up to 200 hectares. If the heavy investments made in irrigation projects are to yield the results expected of them, the agronomist, the soil scientist, the extension worker, the drainage engineer and the economist will have to sit down with the irrigation engineer and consider what would be the best cropping patterns to adopt in various parts of the command, what would be the best way of meeting the water requirements of the crops to be grown, how excess water should be drained away and how various on-farm works should be financed. 17. In this background, the broad features of a water policy which might suit our circumstances would appear to be somewhat as follows:—

- i) All land and water management problems must be viewed as a whole, as they *do* constitute an indivisible whole and cannot be considered in isolation from each other. Soil erosion, denudation, droughts and floods are all symptoms of the same disease of poor land and water management.
- ii) The natural unit for the planning and execution of all land and water management programmes is the sub-catchment which must retain for local use all the water which it needs. It is only if this principle is adhered to that it will be possible to build up rational River Basin Plans on the basis of plans for each of the sub-catchments within the basin. Needless to say, such River Basin Plans will deal with land use matters as well as with the use of ground and surface water resources and the prevention and control of floods.

- iii) The conservation of water to the maximum possible extent must obviously be worked for. It must be realised however that this is possible only if the conservation of the soil is achieved as a pre-requisite. The prevention of erosion by water must therefore form a cornerstone of any water policy.

Big projects such as are the vogue in this country take decades to design and build . . . require large areas of precious land . . . are subject to serious evaporation and transmission losses . . . and demand stupendous outlays for their completion.

- iv) Since water is best and most conveniently conserved in the form of groundwater, high priority must be given to the replenishment of groundwater resources by natural as well as artificial measures.
- v) The maximum possible development of groundwater must be aimed at in view of the unique natural advantages offered by this resource. All

the administrative, technical, financial and legal measures necessary for this purpose must be adopted as a matter of priority and the care of this resource should not be neglected any longer.

- vi) There is great scope for improvement in the working and utilisation of the potential of existing and on-going surface irrigation projects, and therefore for a quick increase in our agricultural production. Priority attention must accordingly be given to the investigation of shortcomings in each project and thereafter to their rectification. Steps must also be taken to make each project financially viable.
- vii) New surface irrigation projects must be investigated with great care and steps taken to avoid the mistakes noticed in the planning and execution of similar projects in the past.
- viii) Land and soil are our most precious non-renewable resources and must on no account be allowed to be damaged by water in the form of floods or waterlogging.
- ix) Water must be used with the utmost economy, whether for agricultural, industrial or domestic purposes. It must also be protected against pollution by agricultural, industrial or municipal wastes. Recycling techniques must be investigated and adopted wherever possible.
- x) The problems of water management are, by their very nature, not such as can be tackled by any single discipline. All the disciplines concerned with good land and water management should be brought together under new integrated Departments of Land & Water both at the Centre and in the States.
- xi) Water is a national asset and must accordingly be placed in the Concurrent List.



BADGER GASSING STARTS

Gassing of Badgers in certain areas of Avon, South Gloucestershire, Wiltshire and part of Cornwall is to start in September, now that THE WILD CREATURES AND WILD PLANTS PROTECTION BILL has been given the Royal Assent. Cyanide gas will be used in the sets in what looks like a policy of total "elimination". The stated reason is that badgers infect cows with T.B., yet the part that badgers play in the spread of the disease is by no means clear. All the evidence appears to be circumstantial. Two years ago a government report virtually stated that the badger is *not* responsible for the spread of T.B. Since then the "kill-it-if-it-moves-and-spray-it-if-it-doesn't" brigade seems to have won officialdom over onto its side. Foxhounds cross grazing land in mass and seem a more logical source of infection than badgers which will rarely soil on grassland. But have foxhounds even been blood-tested? Brock is assumed guilty until proved innocent, and perhaps will be made extinct on scant evidence.

Ag.



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INDIA IN THE YEAR 2000

by J. C. Kapur

Where does the future direction lie? Is it possible to create a viable social order and to protect it from outside threats of violence and internal sabotage?
How can India reject consumerism as its goal when even the basic needs of 550 million of her citizens remain unsatisfied?

India is already launched on an ill-defined path on the first stage of consumerism. Powerful forces are at work to set her on one or another of two directions so as to accelerate the speed and to make her commitment to one or another of these techniques of development complete. It matters not whether this is a consumer society based on socialist planning or on the capitalist system; in India it is a combination of the two. But once launched on either of these roads, there is no retreat. And there is no guiding hand of restraint, no inner voice to show the light, only technological imperatives and compulsions, and the unbridled march towards advanced stages of consumerism in a world of brutalised dehumanised men and an ever spiralling tax burden to pay for the machines of our own destruction.

But once a nation rejects unbridled consumerism as its goal and accepts the entire range of limitations and constraints — of population, energy, resources, environment and, above all, of human imperfections, then unlimited possibilities of social rearrangements can become possible. The emphasis, on an economic level, shifts from uncontrolled production to employment and the basic thrust shifts from capital for labour to labour for capital, and to the maximum use of human resources; from luxuries to basic necessities; from an ocean of goods to quality goods, from status symbols to urgent needs. It shifts from built in obsolescence to durability, waste to recycling, dissipation to conservation. On a human level the

emphasis shifts from material gains to psychic elevation, uniformity to variety, simplification to complexity, insecurity to stability. Finally on the societal plane, orientations turn from providing luxury for the few to supplying the basic needs of the masses. One thing is certain; such a society cannot be created unless the bulk of the people accept the goal and the sacrifices to realise the goal. Purely on an intellectual level, without mass participation, such societies will remain vulnerable. Furthermore any change in the political and constitutional structure alone, without a simultaneous national consensus on the objectives and techniques of development may serve only the interests of certain individuals and groups and will lead in the long run to national disaster.

Every element of waste in the final stages of consumerism tends to give the appearance of increasing the G.N.P. while an accelerated downward trend may have already commenced. The last decade has also seen the shattering of many dreams and illusions about the consumer society irrespective of the socio-economic organisation for its realization. The leadership of the entire spectrum of national life should take heed and understand that India can only have an Indian dream and an Indian personality. The distant images of affluence also carry with them the visible signs of their own collapse.

The juxtaposition of the power centres within the country, the alignment of international forces, the environmental and resource pres-

ures, the new awareness amongst the youth are all conducive to the evolution of a national consensus on new goals and the strategies for their realization. Two major developments that have surfaced in different parts of the world during the decade of the seventies have further improved the chances of achieving such a consensus.

Firstly societies in the early stages of consumerism are staggering under the growing weight of obsolescences, waste and pollution; unemployment and alienation have started producing signs of disintegration.

Secondly, China — a nation of 750 million people — after two decades of isolation, burst upon the world as a new experiment in mass participation and the intensive use of manpower as capital, and the rejection of consumerism.

India having taken the first step towards consumerism and having committed its social, political and economic institutions and processes to this objective now finds itself in a great dilemma — It cannot see through development of a mass consumer society due to the limitation of resources and environment, and the available time scale. It cannot reverse the process because of the massive commitment already made, and the consequences of such a reversal, apart from dislocating the development processes, will not be acceptable to the elite, the major beneficiary of these processes. It cannot continue with these processes because of the growing economic disparities, static employment, the rising cost per capita for creating

employment, growing inflation, instability and unrest.

So within the Indian context the basic issues to be faced are: which technique of development to follow to offset the goals of consumerism; what level of consumption can be expected in terms of resources and environment; how to distribute such resources equitably, how to transform the society from this present orientation to a new acceptable form with a minimum of hardship and dislocation, and in the shortest possible time.

Self Sufficient Rural Republics

Not only does 80 per cent of India's population live in rural communities, but over 83 per cent of the 567,000 villages have populations of less than 1000 persons. The population of over 60 per cent of the villages is less than 5000. The only thing common in these far-flung, often isolated village communities, is their poverty and

neglect. Their climate, agricultural produce, many physical features, resources and cultural pattern, and language are as diverse and as far apart as any two European countries. Therefore to centrally plan and direct their development effort to achieve uniformity and to serve a national or human purpose is meaningless. The failure of our national effort during the last quarter century stems largely from our inability to tackle problems of such wide diversity in a meaningful manner.

India's unit of planning should not be the total 570 million people but should be a community of 500-1000 persons. Each one of these communities should be developed into self-regulating, self-supporting communities. The development effort should begin simultaneously in all these communities and should, within a period of 10 years, cover most of rural India. The people will work in and around their homes

and will have the responsibility of governing themselves. They will run their own schools, hospitals, dispensaries, co-operatives, banks, post and telegraphic offices and extension services. They will have pride in their work and achievement. These communities should attain capabilities to maintain their basic features. This will only be possible if everything is reduced to its real value.

In a politico-socio economic structure, such as India's, the creation of decentralised communities is not now possible unless there is a powerful planned organisation for decentralisation of an entire range of activities and the present trends are reversed. Pressures to keep or diffuse population in the countryside alone will lead to the urbanisation of the countryside rather than to the creation of the type of rural milieu that India needs. Industrial decentralisation alone will call for total decentralisation.

TABLE ONE
GROWING POPULATION, LABOUR FORCE & UNEMPLOYMENT - 1974-1999

[illegible]

tion of the political, administrative, financial and cultural structure.

This can stop the exodus to the urban areas because the destination is not welfare but a city slum. Usually it is a socially forced migration caused by a system of economic forces that they cannot control. The development of the rural area in a true sense cannot take place unless first the economic pace can be brought to a point to support and sustain schools, hospitals, social services, sanitation and medical facilities. Unless we can trigger off an economic chain reaction to sustain adequately satisfactory living conditions and jobs for all in the rural setting, we will never be able to reverse this trend. And the longer this trend will continue, the sooner the rate of unemployment will double. It will then become possible to contain these processes through peaceful means. Table I shows the growth of population labour force, and unemployment during the quarter century to the year 2000; there are today less than 25 million people who are employed in the organised sector of industry, commerce, Govt. and quasi Govt. agencies. In what kind of development will we absorb the backlog of 50 million unemployed and 120 million who will enter the work force during the next 25 years? This question remains largely unanswered.

It will be much easier for us to carry our concern for the new quality of life to the farms and villages than to the exploding urban centres. The integrated plans can start with an increase in agricultural production, and then proceed in various stages to broader social objectives.

The organisation of the rural republics will have to be a deliberate process of decentralisation and will require an effective mechanism and a system to restrain the over-powering effects of the centres of elitist power which are largely urban or urban-manipulated. The experience in India and the other developing countries with elitist education and leadership as the entire spectrum of activities emphasises the need for the transfer of basic knowledge and information relating to the development of an entire stratum of rural society in every village. The block

development organisations have over the decades drifted to the control of vantage point of the life and needs of the people in the rural areas, so that the supply of fertilizers, seeds, cement, and steel is made available only to select and limited groups of people; and the same corrupting influences which have become a bane of industrial life in India are also corrupting rural life, on a wide spectrum.

The pillars on which the foundations of the rural republic will rest are:

- 1) Agriculture — Livestock — Energy Economy
- 2) Basic education and understanding of processes which control agriculture production, ecology,
- 3) Innovation and application of knowledge of appropriate low energy technologies to a spectrum of productive processes and crafts.
- 4) Community welfare, sanitation health, cultural, aesthetic and spiritual activities.

1. (a) Imperatives of Agriculture

The world per capita food production during the last quarter century increased by about 45 per cent. It thus kept fairly well ahead of the population growth. But the largest increases in the production of food took place in the more affluent countries, and over half these increases were absorbed by the upper one quarter of the world population. less than half went to the remaining three quarters.

This is largely due to the changes in the eating habits of the more affluent countries where a little over 20 per cent of the calories consumed come through the direct consumption of cereals, pulses and nuts and the balance from meat, eggs and milk products, sugar, fats and oil etc. For instance, the Japanese now eat more beef and less rice than they used to. The farm value of U.S. per capita food consumption is about Rs. 1500/- (U.S. \$200) while in India it is about Rs. 300/- (or U.S. \$75). Thus, the Americans get most of their calories in meat, fat, eggs, and milk products while in India most of the fat and proteins come from cereals, pulses and vegetable oils. For these reasons the Americans on the average consume

5 times as many plant calories as an average Indian. A similar situation also exists in other affluent countries in varying degrees.

In countries like India, over 80 per cent of the calories consumed are derived largely from cereals, pulses and nuts. In many instances, 60 to 85 per cent of the disposable income of an average person is spent on food. Therefore any food price increases without a simultaneous increase in earning capacity can seriously reduce the minimum calorie in-take. Growing children are particularly vulnerable under such conditions. Rising prices in a structure of elitist development also tend to reduce surpluses in cereals and pulses; and this position is further aggravated by emerging changes in the diet of more affluent segments of society.

While 'graduation' to an animal protein diet may be a desirable status symbol, it is a wasteful method of supplying human dietary needs. The domestic animals are only from 15 to 20 per cent efficient as they consume 4 to 7 times the energy content in the edible products of their meats. The rising trend in both developed and developing countries of obtaining more and more of the nourishment through relatively less efficient methods is placing a very severe strain on the world's food resources.

A 75/25 mixture of soya beans and corn flour produces 50 per cent protein and contains all the essential amino acids found in red meat at less than one tenth of the cost. Furthermore an acre of land can yield as much as 1000 Kgs of soya beans containing 400 Kgs of protein, while the same acre of land if devoted to maintaining animals for meat will provide less than 70 Kgs of protein.

Over the last two decades the area of land under cultivation in India increased by about 20 per cent and the use of chemical fertilizers starting from a relatively low base increased by about thirty-fold. Similarly, the rice production increased by over 100 per cent, wheat 340 per cent. India's population has been growing at an average of 2 per cent during the last few decades and even at a progressively diminishing rate of 1-1.5 per cent by the year

2000, the population is expected to be of the order of 850 million. If this projected population were to consume an average intake of 3000 calories per person per day, which meets general health standards, largely (about 2400 calories) through cereals, pulses and vegetable proteins and the rest (about 600 calories) through meat, milk products, chicken, fish and eggs, India would have to produce approximately 250 million tons of food grains by the year 2000. To increase food production by about 140-150 per cent during the next 25 years may appear to be an insurmountable task, but technologically and resource-wise it is well within our reach.

Perhaps the most important of the limiting factors in agricultural production is the availability of water. About 500 tons of water are required to grow a ton of wheat. For producing an additional 150 million tons of food grains, we will need 75000 million tons of water. The direct and indirect additional energy requirements for such massive increases in production will be of the order of 75 million tons of coal of heat equivalent or about 50 million tons of oil. This energy will include all agricultural processes as well as manufacture of equipment, chemicals, pesticides, transport and other factors which go into the modernisation of agriculture.

The present per hectare yield in India is about one ton of food grain. Through the modernisation of agriculture and the supply of inputs, the average yield per hectare can be increased at least five to six. (Yields up to 7 or 8 times higher have been achieved in India.)

The present gross-crop irrigated area in India is about 40 million hectares and this can be increased by about 1.5 million hectares per year during the next 25 years, by all available means, such as major and minor irrigation projects, diversion of river water, canals, tanks, tube wells and so forth. Table 2 shows the ratio of mechanical/energy used through various inputs in the process of modernising agriculture. Energy equal to total of 0.614 equivalent tons of coal is required to produce one ton of food grain.

It will be observed that well-irrigation and fertilizers consume about 60 per cent of the total energy used in modern agriculture. It should be possible to reduce this to less than half through organic farming. Savings can also be effected by restricting the use of high horsepower farm equipment. Crop drying is another area where energy economies can be effected by using solar energy for this purpose.

TABLE TWO
****FOOD ENERGY YIELD vs**
MECHANICAL ENERGY USED
EQUIVALENT TONS OF COAL
PER TON OF FOOD GRAIN

	Equivalent tons of coal per ton of food grain	Ratio of mechanical energy used to food energy produced
Irrigation from wells	0.195	0.167
Chemical fertilizer	0.156	0.134
Fuel for machinery	0.104	0.089
Farm tools & machines	0.055	0.047
High yield seeds	0.008	0.002
Plant protection	0.003	0.001
Crop drying	0.016	0.013
Transport	0.009	0.008
Storage & Marketing	0.003	0.002
Food processing	0.065	0.056
	<u>0.614</u>	<u>0.519</u>

***Computed from Gerald Leach Roger Revelle Studies.*

The high energy requirements noted in the above paragraph account for about 0.48 equivalent tons of coal or about 78 per cent of the energy consumed in this process. Economies of up to 40 per cent of the total energy used are possible through the revival of the livestock energy economy and (marginal) uses of solar energy.

1. (b) Livestock-Energy-Economy

In order to achieve the objectives of an accelerated agricultural production, and to lay the foundations of a new sector of development with wide-ranging benefits for the communities in the rural area (within the constraints of our resources and ecological consideration), it will be necessary to revive India's livestock energy-economy.

Not long ago India had over 30 per cent of the cattle wealth of the world. Even after half a century of neglect, the livestock population is still 176 million cattle which is about 15.8 per cent of the world's total cattle population. It is approximately in the same ratio as the country's population to the world population (see Table 3).

TABLE THREE
LIVESTOCK — ENERGY
ECONOMY OF INDIA
TOTAL POTENTIAL

I LIVESTOCK	(in Millions)		
	World	India	% India/World
Cattle	1,115	176	15.8
Pigs	609	4.9	0.81
Sheep	1,081	42.5	3.90
Horses	69	1.0	1.45

Source — United Nations — Statistical Year Book

(i) Organic Manure

The above cattle population generates about 1400 million metric tons of gobar (cow-dung) per year. More than 50 per cent of this is being burnt as fuel in the rural areas. To this we could add the waste from all the other animal populations and the organic waste from plants, and thus increase the available waste considerably. If most of the gobar could be collected and supplemented with plant waste to correct the carbon nitrogen balance and then digested in the biogas plants, we could obtain over 100 million tons of organic sludge with 3.5 million metric tons of nitrogen content.

This sludge contains many elements essential for plant life. Nitrogen, phosphate, potassium plus small quantities of trace elements, metallic salts such as boron, iron, manganese, sulphur and zinc.

Nitrogen is considered especially important because of its vital role in plant nutrition and growth. Digestive sludge contains nitrogen mainly in the form of ammonia while nitrogen aerobic organic waste activated sludge is mostly in oxide form (nitrate and nitrite). Increasing evidence suggests that for many land and water plants, ammonia may be more valuable as a nitrogen source than oxidised nitrogen. In the soils, it is much less likely to leach away and more apt to become fixed to exchange particles i.e. clay and humus. Stimulating fertilization with digestive sludge produces greater increase in the nitrogen component of fertilizer than doing so with organic fertilizer in equal amounts. The nitrogen fertilizer value of digestive manure sludge varies from 2.7 to 4.9 per cent of the dry weight.

Thus, through the effective processing and use of various kinds of organic wastes, the condition of the soil can be improved; and it can be

saved from the long-term ravages of misuse and the excessive use of mineral fertilizers.

To optimise the use of organic manures and to minimise the use of supplemental chemical fertilizers, it would be necessary to have some basic information on the soil condition in different parts of the country.

(ii) Energy

The biogas digestors can also generate about 1.1 million million cubic feet of methane gas, with a heat value of 1000 B.T.U.s per cubic foot.

This is equivalent to 8000 million gallons or 190 million barrels of gasoline per year; and it is equivalent to 100,000 million horsepower hours at 25 per cent efficiency or 36 million tons of coal or 25 million metric tons of oil per year.

Therefore the only hope to rehabilitate the stagnating rural economy is through the use to the maximum extent possible of the potential in the livestock energy economy. The efficient recycling of the livestock, human and plant waste to produce biogas and the nitrogen-rich digested sludge can serve the dual purpose of meeting some of the essential energy needs of the rural communities such as cooking and lighting and also of increasing agricultural production through ecologically desirable and inexpensive techniques of fertilizing and soil conditioning.

If we can break through the vicious circle of stagnation through the use of relatively cheap and inexpensive inputs, a chain reaction of growth and welfare of unimaginable magnitude can sweep the countryside, and change the face of the country by the end of the century. Apart from the initial catalysts of resources and appropriate technologies — both well within our reach — the recipient rural communities can generate their own surpluses to accelerate the processes of their growth and welfare and uplift. Only thus will the continuity of an integrated upward spiral of material, mental, aesthetic and spiritual well-being of the communities be assured. Intermittent starvation and doles destroy human dignity and corrode the will to act and be productive.

A Model Rural Community

In the rapidly narrowing circle of energy resources and ecology, the definition of modernism will also undergo a change. All societies which produce less energy than they consume, and continuously draw on nature's balances, will start withering away when these energy surpluses vanish. And the status symbols which define "modern man" today, such as oversized automobiles and houses constructed of cement, steel, aluminium, plastic and glass, will become untenable in economic terms, and perhaps "old-fashioned" in terms of social norms. It is in this context that we must approach the future symbols of modernism, i.e. the self-sufficient, self-supporting integrated rural republics.

As stated earlier over 83 per cent of the rural population lives in villages with populations of less than 100. Any socio-techno-economic plan must therefore be based on units of below 1000. An attempt has been made below to develop the outlines of a rural community of 1000 persons, with 400 hectares (1000 acres) of cultivable land, and about 300 head of cattle. The energy needs of such a community, and the extent to which such needs can be satisfied through the recycling of animal, human and plant waste have been estimated. Table 5 indicates the volume of organic manure and biogas that can be produced per year with one hundred and with three hundred head of cattle. Table 4 outlines the energy needs of such a community. It will be obvious from a study of

Tables 4 and 5 that a substantial proportion of the household energy needs of such a community can be met through processes of recycling. Similarly the needs of organic manure to the extent of about 2500 tons (6.25 tons per hectare) of digested sludge and about 7 tons (18 Kgs/Hectare) of nitrogen can also be met through the same process. Additional needs to supplement energy and chemical fertilizers can be met from other sources.

Economic Viability of Such a Community

If all the 400 hectares of land were to be brought under intensive cultivation for cereals, soya beans, legumes, oil seeds, vegetables and animal fodder, it should be possible, under normal conditions for this community to: a) meet the total dietary needs of the population at 3000 calories per person in an adequate combination of cereals, proteins, animal protein and oils; b) provide enough fodder and grains for the cattle; and c) generate adequate surpluses to make the community self-supporting with regard to all its other needs for energy, fertilizers, cloth, education and medical facilities, and above all community welfare. While the exact nature of the surpluses will depend upon the village location, the cropping pattern and some other considerations, it should normally be possible to produce an additional 750-1000 tons of wheat or soya beans or a combination of these and other produce. The market value of such produce will be of the order of Rs. 1,000,000 (U.S. \$130,000).

TABLE FOUR
PRODUCTION OF BIOGAS AND ORGANIC MANURE IN A
MODEL RURAL COMMUNITY OF 1000 PERSONS

A	(a) Gobar (Cowdung)	$100 \times 50 \times 365$		
		2200	=	860 tons
	(b) Solids			
	20% of (a)		=	172 tons
	(c) Digested Sludge			
	40% of (b)		=	68.6 tons
	(d) Nitrogen			
	3.5% of (c)		=	2.35 tons
B	Gas			
		$172 \times 2200 \times 3$	=	11,00,000
				1.1m cu.ft.
				3m cu.ft.

TABLE FIVE

ESTIMATED ENERGY NEEDS OF A RURAL COMMUNITY

POPULATION — 1000
 AREA UNDER CULTIVATION — 400 Hectares
 (1000 acres)

Application for which energy required	Preferred Source of Energy — In order of preference	Basis of Estimation	Annual Energy Requirements million cu.ft. of gas	Estimated Electrical Energy
PHASE I				
1) Cooking	Gas, Solar, Wood, Coal, Kerosene, Electricity	7.5 cubic ft. per person per day	2.75	
2) Lighting				
a) Residential	Electricity - Gas	3 mantles of 2.5 cu.ft. per hour for 2 hours	1.09	25W/person (25 KW) 36,000 KW Hr.
b) Streets, Public areas	Electricity - Gas	100 mantles for 3 Hrs of 2.5 cu.ft.	0.275	
3) Domestic Water Supply	Electricity - Gas	7.5 Gallon/ person per day	0.135	(4 KW connected 6,000 KW Hr.)
4) Maintenance of optimum temp. in Biogas Digester	Solar - Gas	20% of gas produced mostly from Solar energy 5% from Gas	0.165	Gas
			<u>4.415</u>	
5) Irrigation from wells	Animal, Electricity, Gas - Solar	Grain yield of 5 tons a hectare or total of 2,000 tons	5 (0.45 x 10 ⁶ BHP Hr. at 25% efficiency)	
6) Other direct energy inputs	Gas, Oil - Electricity	Grain yield of 5 tons a hectare or total of 2,000 tons	1.54 (0.14 x 10 ⁶ BHP Hr. at 25% efficiency)	
Analysis				
Domestic load		= 4.250 million cubic ft. of methane gas		
Irrigation load (if through wells)		= 5.00 million cu.ft. of methane gas		
Other direct energy inputs such as supplementary fertilizer, fuel for machinery, tools, transportation and processing		= 0.45 million cu.ft. of methane gas		
		<u>9.70</u> million cu.ft. of methane gas		

This, therefore, is the extent of the potential in a rural community of one thousand persons.

A per capita investment of Rs. 5000 can cover the cost of getting this community started on the process of modernisation of agricultural production, the rehabilitation of the livestock-energy-economy and the improvement of living conditions and sanitation through the recycling of all waste.

In less than ten years, the areas of production, employment and social welfare can be vastly expanded through resources generated within the community itself. It will help offset the increase in population and labour force.

2. Technology — Energy — Industry

In an era of rapidly proliferating technologies, non-agricultural productive effort based on low-energy technologies appropriate in rural communities cannot be sustained in the presence of higher technologies in identical industries in the urban area. Planned effort will therefore

be necessary to differentiate between areas of high energy technology and appropriate low energy technology production. India has already gone far on the road of thoughtless commitments to many technologies. It would call for a massive dislocation of the existing technological structure to bring about the desired rearrangement.

The present technological thrust of the country, money and personnel-wise, is all pointing towards the frontiers of technologies. The effort on an entire spectrum of technologies is either flowing into the main-stream of super-high technologies or drifting into blind alleys or is being frozen at different levels of uselessness or ineffectiveness. Its patronage and its benefits are limited to the elite with very limited relevance to the problems of the country at large.

Considerable effort is being directed towards unrelated problems, and incentives all along the line are to push one or the other aspect into the international main-

stream for the highest prestige and monetary gain. Therefore all we have is technologies largely irrelevant in the Indian context and personnel motivated but not equipped to tackle problems on the frontiers. Therefore we get neither the conquest of the frontiers of technologies except on a very narrow spectrum, nor appropriate technologies for rural development. In order to change this situation, Indian science and technology must have two orientations:

1) The first mainstream must consist of areas relating to advanced technologies of special interest to India. Sectors of particular interest would include new energy technologies (nuclear fusion, coal gasification, undersea exploration of oil and gas) and public transportation, communication and electronics, agriculture and fertilizers. All available resources should be co-ordinated and integrated to achieve international parity in all these and other areas of interest, in the shortest possible time. The rewards should be aptitude, desire for achievement, national pride, rather than excessive monetary gain or frivolous consumption. Only when we can separate achievement from elitist rewards will there be an integrity of purpose in the handling of scientific and technological objectives. Only then will we be able to make advanced technologies an instrument of national development and not power-centres for the aggregation of political and economic powers.

2) The most important objective of Indian science and technology has been and will continue to be how to increase the productivity of the land without creating technological unemployment and to increase the agricultural and non-agricultural potential of rural India. A hundred per cent increase in agriculture production can mean 50 per cent increase in employment. A 15 per cent increase in agriculture can offset India's population explosion.

The first and foremost task in science and technology in the rural context is therefore: to stop the misuse of organic waste, human, animal or plant and direct it towards reviving the country's livestock energy economy. The country's best scientific and techno-

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logical resources should be directed to achieve these objectives by optimising equipment and techniques relating to this development.

Social and caste barriers have inhibited the large-scale application of human and cattle wastes. Therefore the development of appropriate technologies to reduce the manual handling of these wastes to the minimum will go a long way in encouraging widespread use of organic manure, in recycling waste, and in the use of finished products, that is gas and organic sludge.

Only low technology, low energy jobs are possible within our resources. Maximum employment and other benefits will accrue with such techniques. But the tragedy of the situation is that while on the one hand, the compulsions of the growing population, increasing unemployed work force and the shifting levels of appropriate technologies are fast increasing the cost for their application, on the other, advanced techniques that are being applied to meet the growing pressures of consumerism of the elite are rapidly narrowing the areas for the successful application of intermediate or appropriate technologies.

There has therefore to be a very precise definition of the areas which lend themselves to an in-built protection from fast advancing capital intensive technologies. In societies committed to consumerism, in terms of attitudes, social compulsions, economic orientation and political power balances, the concept and plans for increasing employment always in the end lose out to achieving the highest productivity irrespective of its effect on employment. And yet the larger the ratio of the unemployed to employed in a society, the greater the need for control on unbridled consumerism. Unless these basic issues are resolved the increase in non-agriculture employment potential of rural areas will remain uncertain.

3 Education and Training

All education has its roots in some images of the future. So long as these images remain distorted or unreal, the educational system instead of preparing the youth for tomorrow, destroys our educational

effort. And the youth with a vested interest in the future feels betrayed.

Therefore to design an education system for tomorrow, we have first to define the kinds of society for which the youth have to be prepared. There are no facts to guide us on the path, because there are no future facts.

Our knowledge and learning are divorced from our work, our work is divorced from our leisure. The youth see no relation between what they are doing in school, and their future occupational status. Therefore everything present starts losing its meaning. Then of course all the knowledge is of the outside and none is turned inwards; and the personal responsibility which sustains social institutions has also started fading away. We are rapidly abandoning our past without realizing that without the past we will be like a leaf in the storm, and those hidden bonds that have maintained the unity and integrity of the country all these centuries will snap.

In a consumer society the emphasis shifts from knowledge to information, so that when information becomes obsolete, man also is rendered obsolete. When such information improves the recipient's position in the society, it attracts an increasingly larger number of people towards its acquisition.

The rural republics will need a new kind of community school, which will deal largely with the concerns of the rural life. All elements of competitive behaviour which corrode community life should have no place in the communities of the future. The schools have become the instruments of promoting consumerist values, and newer educational techniques are being invented to perpetuate these values. The new education should instead provide simple insights into the nature of the environment, and how to correct its maladies. The basic objective should be to transmit knowledge directly to those who have to plough the fields, protect their crops and provide the foundation for life for themselves, their families, the community and the nation. True liberation will take place only when the areas of manipulation of the tiller's life through knowledge or through

control of his needs are reduced to the minimum.

The facts relating to ecological balances of nature have been understood for centuries. But the language of science and technology in which they are now expressed is not understood. Simple things have now been given intricate names, which are outside the comprehension of most farmers, and as such, knowledge has become the instrument of control and coercion, while the farmer's problem remains unresolved, and agriculture moves in an elitist direction. We therefore need a new type of multi-purpose teacher, who understands the new knowledge and can transmit it in simple terms, on an entire spectrum of needs.

The language may be different, the emphasis may vary but in content people from all parts of India, should have similar opportunities to acquire knowledge of the national purpose, its development and the common thread of history, culture and tradition which unite the country. Social responsibility should be an important content of such education.

For each of India's approximately 385 districts, there should be a rural development or revival school. In this context, the school does not mean a set of impressive buildings, equipment and furniture, but multi-purpose teachers with simple tools and techniques for transmitting knowledge on a broad spectrum of problems. In the proposed rural communities, the open fields or the multi-purpose village buildings can be used for this purpose. For more intensive training, farmers in groups can be required to reside for brief duration of 10-15 days at the training centres at district headquarters. To make this kind of education self-supporting, a nominal boarding and lodging charge should be levied in accordance with the ability to pay.

The instruction should include practical husbandry on land, multiple cropping patterns, simple economics in the use of organic manure and chemical fertilizer, plant protection techniques; the ecological hazards of pesticides; assessment of crop yields and storage techniques and equipment to be used in storage. It should

also advise them of marketing possibilities, prevalent prices, Government regulations, availability of financial assistance, methods of obtaining finances and interest rates; maintenance of building and equipment and tools; irrigation and water conservation, animal husbandry and dairy farming; instruction on income supplementing possibilities in off-season through poultry and craft also can be very useful, as can simple book keeping. In fact, the aim should be to spread all kinds of useful knowledge in simple understandable terms. Other useful fields of instruction can be in the area of simple medical remedies, techniques for simple construction of road and building with locally available materials, part-time operation of post and telegraph office, and organisation of festivals and social activities.

Men, women and children can all participate in the learning process, and acquire diverse knowledge for the benefit of the family and the community. In the family unit of work, time and seasons have a different meaning than in the regimented industrial societies; therefore the learning process can be moulded to suit abilities rather than being subordinated to time exigencies as in industrial societies.

4. Health and Social Welfare

The compulsions of consumerism do not limit the aggregation processes to the economic or political arena or to energy and technology; rather they are all engulfing. Even human reproduction and health do not escape the ever widening influence of these processes. The rapid aggregation of population, and the aggregation of many minor ailments into incurable diseases are some of the other side effects of the elitist consumerist development. It is an amazing fact of life that as the medical facilities increase and more and more doctors and nurses enter the profession, medical care recedes farther out of the economic reach of a large bulk of the population. What is true in India is many times more so in the case of more affluent societies like the United States.

As in the case of industrial development and scientific research, there

has been a remarkable improvement in the Indian talents and capabilities to tackle many intricate medical problems. But there has been no significant improvement in delivering ordinary routine medical care to the people at large. Nor is there any future hope for improvement in this situation in a structure of elitist development. One of the primary tasks of the rural republics of the future will be to organise co-operative endeavours to improve public health and sanitation. Emphasis on preventive medicine and care can reduce the need for curative medicine and medical personnel.

One or two of the residents of each of the rural communities can be given a training for 3-6 months to attend to problems of immunisation and also to provide medicines for some of the minor ailments. Along with district centres for rural revival there can also be a medical

**"All regret for the past is vain,
every desire to revert to a
former social stage is unreal.
There is no possibility of
turning back."**

Jacques Ellul

centre with adequate equipment and facilities to attend to the investigation and treatment of more serious illnesses. This district-level centre can also help in expanding and updating knowledge of diseases and of pharmacopeia among village or community-level workers from time to time. These centres can also guide the communities on the handling, treatment and storage of human and cattle waste, its conversion in the biogas plants and its utilization as fertilizer.

There is a need to train over one million health-cum-social workers in the next ten years who can perform the functions of health and sanitary inspectors, immunization,

the cure of minor illnesses, and also to transmit knowledge on family planning techniques. In a few years, the medical system should pay for itself through a minor charge on all services, or else the surpluses generated by the rural communities should pay for these services.

As in the case of development, so also in the case of health, India's real challenge lies in delivering medical care to the rural communities. And this will remain totally out of reach through elitist techniques.

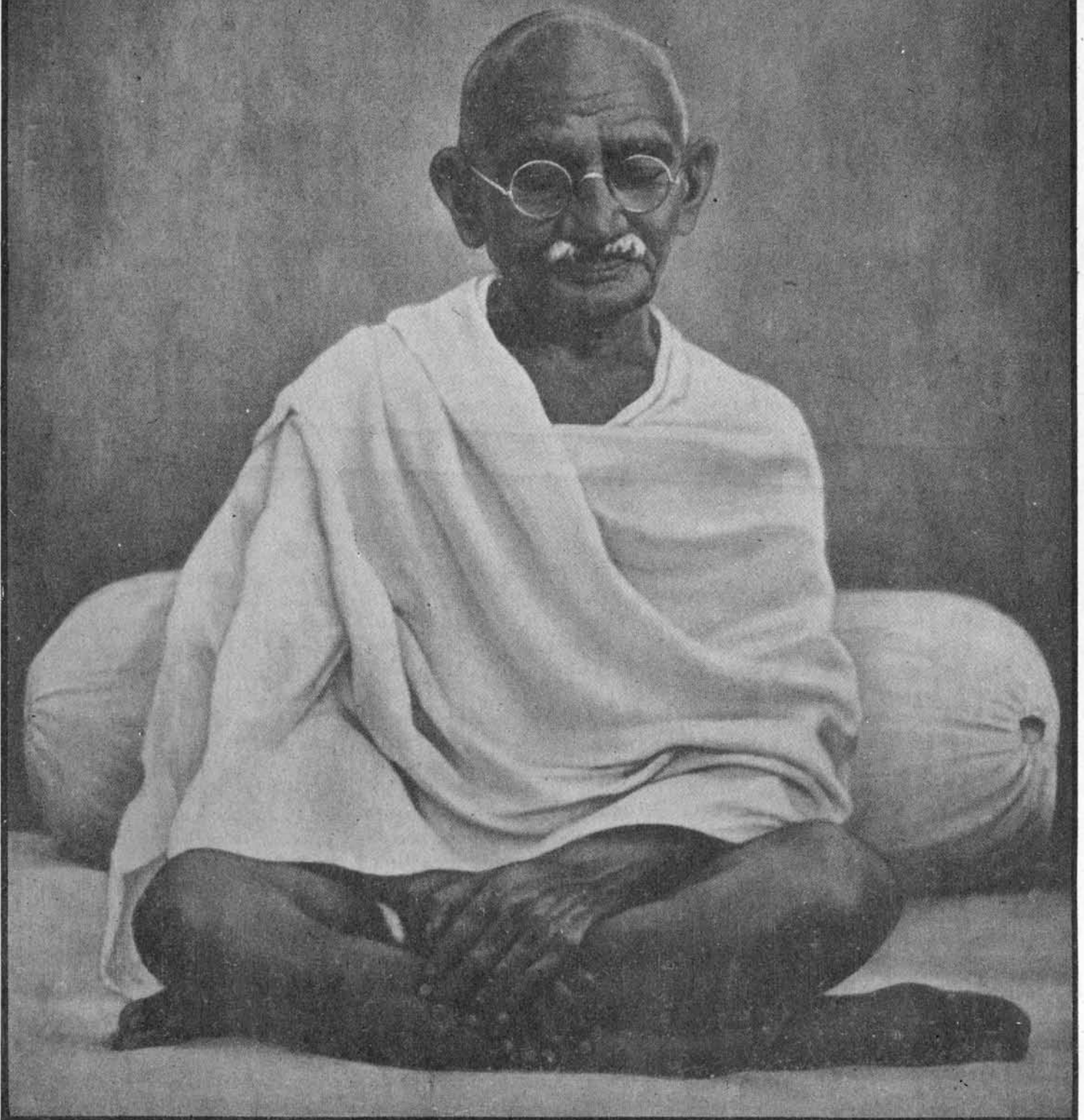
Four thousand years of culture and tradition are enshrined in over half a million of India's villages. In spite of the vicissitudes of history the stability and the continuity of the country has largely rested on rural India. While there is an urgent need to bring the rural communities into the mainstream of national life and make them participants in the processes of welfare, there is an even greater need not to distribute this welfare by distributing the products of high energy and technology from urban areas. True welfare will be possible only when the tools and energy and not products will be placed in their hands. Even the process of democracy as Mahatma Gandhi said "cannot be worked by twenty men sitting at the centre, it has to be worked from below by the people of every village".

The plea to develop rural republics is not the outcome of a desire to revert to the past but to the modernism of the recycle society of the late twentieth century. Jacques Ellul, the French philosopher of the late twentieth century rightly says that "All regret for the past is vain, every desire to revert to a former social stage is unreal. There is no possibility of turning back or annulling or even arresting technical progress. What is done is done. It is our duty to find our place in our present situation and no other. Nostalgia has no survival value in the modern world and can only be considered a flight into dreamland."

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Part 2

The Relevance of Gandhiism



Gandhi's Political

by Adi H.

It is over a decade since the Mahatma left our midst, leaving behind a prolific mass of literature, speeches and writings, touching upon almost every aspect of life — economic, political, social and ethical. The question we are, however, interested in is: "Does one find in all this voluminous literature the ideal of the stateless society?" And our answer is yes: Gandhiji* on more than one occasion alluded to the ideal society as the stateless society. In 1921 Gandhiji wrote: "The state evil is not the cause of but the effect of social evil, just as the sea-waves are the effect not the cause of the storm. The only way of curing the disease is by removing the cause thereof. Let the people purify themselves. Let them cease to indirectly participate in the evils of the state and it will disappear by itself."¹ The passage makes it clear that in the ideal society Gandhiji conceived of the people being so pure, and evil being so nearly absent that there would be felt no need for a state to maintain peace and order.

In 1931 Gandhiji again asserted the anarchist society to be his ultimate ideal thus: "To me political power is not an end but one of the means of enabling people to better their condition in every department of life. Political power means capacity to regulate national life through national representatives. If national life becomes so perfect as to become self-regulated, no representation becomes necessary. In such a state

everyone is his own ruler. He rules himself in such a manner that he is never a hindrance to his neighbour. In the ideal state, therefore, there is no political power for there is no state".² In 1940 Gandhiji identified the stateless society with the completely non-violent society. "That state is perfect and non-violent where the people are governed the least. The nearest approach to purest anarchy would be a democracy based on non-violence," while "a society organised and run on the basis of complete non-violence would be the purest anarchy."³ The completely non-violent society is considered the negation of the state for the modern state depends on coercive authority which implies violence — the fully non-violent state, being a negation of this will, therefore, be the stateless society.

But this ideal society based on *purna ahimsa* or total non-violence, Gandhiji held, was not capable of immediate realisation. The state would undoubtedly disappear when all people became completely non-violent. But, "It is not possible to make a person or society non-violent by compulsion".⁴ To impose non-violence would itself be violence. True non-violence must come from within, it must be a natural and spontaneous growth, and must be the result of the individuals' own exertions and enlightenment. Hence the disappearance of the state must wait till such time as when every individual becomes a genuine votary of non-violence. This may, however, take a very long time since "perfect non-violence while you are inhibiting the body is only a theory like Euclid's point or straight line", hence Gandhiji's exhortation that we practise *ahimsa* and develop the spirit of non-possession or *aparigraha*.⁵ "No one

can attain perfection while he is in the body for the simple reason that the ideal state is impossible so long as one has not completely overcome his ego, and ego cannot be wholly gotten rid of so long as one is tied down by the shackle of the flesh... The goal ever recedes from us. The greater the progress the greater the recognition of our unworthiness. Satisfaction lies in effort not in the attainment. Full effort is full victory."⁶

The State that Governs Least

Such being the case Gandhiji set up as the immediately attainable ideal "the predominantly non-violent state" or the state that governed least. Since men, as they are today, were not the perfect and ideal beings, perfect *swaraj* as connoting that society in which people would rule themselves in such a way that there would be no need of any state, was not immediately practicable. Hence for the immediate purposes a government should be set up which governed least. But this would, firstly, imply a politically free nation. That is why Gandhiji claimed the first step towards the ideal society to be the removal of the British rule. It is only when the people come into possession of political power, he argued, that the interference with the freedom of the people is reduced to a minimum.⁷

In brief Gandhiji's ultimate ideal remained true *swaraj* — in the *Brihadaranyaka Upanishad* sense — as implying the autonomy of the moral self, the moral rule of each individual over himself. But for practical purposes since this ideal was not likely of immediate attainment, *swaraj* was to be identified with Thoreau's ideal of the government that governed least; it was not to mean the acquisition of authority by the few but the acquisition of

* The suffix 'ji' is added to the names of highly prestigious people to denote respect.

Philosophy

Doctor



the capacity by all to resist authority when abused.⁸

But why did Gandhiji desire non-government or, as a workable alternative, minimum government? In other words what is his case against the state? Gandhiji's opposition to the state sprang mainly from certain ethical, spiritual and religious considerations. Gandhiji held duty to one's conscience and loyalty to God to be above the state and political loyalty. In this sense Gandhiji was an individualist. To him the individual's conscience was the prime thing.⁹ "In matters of conscience the law of the majority has no place" is his famous dictum. He claimed conscience to be a higher court than the ordinary courts of justice; in fact it superseded all other courts. Obedience to it was the law of our being. Hence conscience must be obeyed even if that entailed a bitter tear and separation from all that one held dear — friends, family, even the state to which one belonged. Blind submission to the social will was ruled out. It was to be replaced by the enlightened and willing submission to social restraints. But this implied individual freedom, because only individual freedom can make a man voluntarily surrender himself completely to the service of society. If it is wrested from him, he becomes an automaton and society is ruined.¹⁰ But if men willingly subject themselves to social restraint where was the need of the state?

The State as the Enemy

Like the Western anarchists Gandhiji considered the state as incapable of doing any service to morality. He refused to consider any action done under pressure, necessity or compulsion as moral. A moral action is not done mechanically at the behest of a state, it is done con-

sciously, voluntarily and as a matter of duty. Any increase in state power and action was looked upon with fear and suspicion, for although admittedly state action may do some good by curbing exploitation, it did greater harm by cutting at the very root of all real progress, namely, individuality.

Gandhiji attacked the very foundation of the modern democratic state — the principle of majority rule. To him rule by majority smacked of violence. Not infrequently it meant the rule of fifty-one per cent over all. How then could he who had openly denounced the Benthamite principle of the greatest good of the greatest number,¹¹ subscribe to the parliamentary system of government? How could he who had sought all through his life the welfare of the greatest happiness of each and all, put his stamp of approval on parliaments and legislation by majority? "Swaraj will be an absurdity" he once wrote, "if individuals have to surrender their judgement to a majority. A living faith cannot be manufactured by majority."¹² It would be slavery to the majority no matter what its decisions are. The majority principle was alright for matters of detail. But in matters of the conscience it had no place. In addition how could one trust the wisdom of mere numbers? At a press conference in 1944, Gandhiji opined that more important than the mere numerical strength behind an opinion was the soundness of that opinion. Consequently the opinion of even a single individual, if it was sound, must be given greater weight than the opinion of the many.

Nor did Gandhiji have a single good word for any of the parliamentary institutions. In *Hind Swaraj*

he compared the British parliament to "a sterile woman" and a "prostitute". It was like a sterile woman for it had never done a single good thing of its own accord. It worked only under the spur of petitions or any other pressure. It was like a prostitute for it had no real master. It was under the control of changing prime ministers who were always more concerned with power than welfare. "Prime ministers are known to have made parliament do things merely for party advantage." In brief the parliament serves no useful purpose. "When the greatest questions are debated, its members have been seen to stretch themselves and doze. Sometimes the members talk away until the listeners are disgusted." And what is worse this "talking shop" costs the nation a good sum of money every year. If the money and the time wasted by parliament were entrusted to a few good men, the English nation would be occupying today a much higher platform.

Party Politics

The party system equally failed to find favour with Gandhiji. Parties prevented those in authority from working to the public advantage. If one genuinely desired the welfare of all, why need one join a particular party? This was Gandhiji's logic. The party system, by its very functioning, taught its members to put the narrower interest above the national. "Parties bred mutual distrust, led to the imputation of motives and engendered the spirit of littleness."

But if this is so why did Gandhiji associate himself with the All India Congress Party? Was he not guilty of failing to practise what he himself preached? Before passing any judgement on this score we should remember that the Congress party under Gandhiji was not a mere

partisan group seeking to acquire power for itself. It was a mass struggle for political emancipation. As J.P. Narayan writes, "Gandhiji's movement was a people's movement par excellence. It was not *Raj-Niti* (politics of the state) but *Lok-Niti* (politics of the people)."¹³ That is why after Independence when Gandhiji saw that the Congress was fast deteriorating to the status of an ordinary political party, he expressed the desire to convert it into the "non-partisan" Lok Sevs Sangh. And perhaps the fact that Independent India's first cabinet was Congress in name but coalition in practice, comprising of erstwhile leaders of the Jana Sangh, the Communists, the landlords, and some powerful Independents shows the influence of the Mahatma, who desired all to work for the national welfare, regardless of party labels, on our Prime Minister.

Elections were equally abhorrent. The people elected their M.Ps. under the happy belief that thereby they were ruling themselves. But far from establishing self-rule the system of parties and elections created an exploiting class, (the parliament) and demoralized individuals. In *Hind Swaraj* it is written, "Members vote for their party without a thought. Their so called discipline binds them to it. If any member by way of exception gives an independent vote he is considered a renegade." Elections also involved considerable expenditure; they implied propaganda, which encouraged the telling of lies and provided opportunities to self-seekers and job-hunters.

The Impotence of Legislation

Nor, finally, was legislation necessary. It was plain self-deception to believe that an evil could be eradicated by the mere passing of a law. What was really needed was the conversion of the heart. And legislation without a prior conversion was a dead letter. It was for instance futile to think that the age-old evil of untouchability could be wiped out of existence by the mere addition of one more statute to the statute book. "A popular state can never act in advance of public opinion. If it goes against it, it will be destroyed." What the removal of

untouchability demanded was a clean sweep, a complete change in attitudes and outlook. That is why Gandhiji wrote: "I have always held that parliamentary programme at all times is the least part of a nation's activity. The most important and paramount work is done outside."¹⁴ For the same reason Gandhiji attached very little significance to a Bill of Rights as a means of safeguarding individual liberties. When in the year 1920 enlightened Indian opinion was urging the British Government to pass such a bill of rights, Gandhiji wrote in his *Young India* of the thirtieth March: "We do realise the importance of the Declaration of Rights, but we are not much enamoured of the Declaration of Rights business. The declaration will be of little avail if we have not the strength to have it well administered. Unless we become manly and fearless, no number of rights showered upon us can secure us our liberties. It is not unlikely that progress in legislation may outrun the administrative order. . . . We emphasise the necessity of such preparation as of greater moment than the Declaration itself."

Gandhiji was no votary of the law abiding spirit. Laws, if enacted at all, should be for self-preservation. If they, therefore, obstructed growth they were useless and must be set aside.¹⁵ In *Hind Swaraj* Gandhiji argued that no man-made laws can be permanently binding and that if today we have come to believe that our first duty lies in obeying the laws of the state it is only because "we are sunk so low."¹⁶

From what has been said so far, it will be easy to deduce Gandhiji's picture of the ideal society. It may, however, be noted at the outset that Gandhiji himself did not take the pains of systematically outlining the future order of society. In the February 1939 issue of the *Harijan Sevak* he wrote: "I have purposely refrained from dealing with the nature of government in a society based on non-violence. . . . When society is deliberately constructed in accordance with the law of non-violence its structure will be different in material particulars from what it is today. But I cannot say in advance what the government

based wholly on non-violence will be like." But on the basis of the views expressed in his many books and articles it is possible to acquire a fairly clear picture. No doubt our task in this respect is rendered difficult, because, for one thing Gandhiji was not always consistent and for another he deliberately avoided planning for the distant future. He believed in taking one step at a time. Jawaharlal Nehru, a disciple and close associate of Gandhiji once asserted: "I am not clear in my own mind about his objective. I doubt if he is clear himself. One step is enough for me, he says: and he does not try to peep into the future or to have a clear conceived end before him."¹⁷ Yet a brief attempt is made here to indicate the broad outlines of such a society. What follows refers to the completely non-violent society. The predominantly non-violent state, the immediate step before, differs from it only in degrees. Thus, the predominantly non-violent state will be characterised by decentralisation and simplicity — both of which are hall-marks of the non-violent society. Again, in both, heavy reliance will be placed on moral considerations for the maintenance of order. The only difference between the two will be that in the predominantly non-violent state, the state as such will continue to exercise extremely limited authority.

Moral Coercion

In the ideal non-violent society everyone will be his own ruler. There will be no superiors, no authorities, no leaders. "We must evolve the capacity for going on with our programme without the leaders. That means self-government."¹⁸ Every individual will be a law unto himself. His conscience, the voice of God, will be the final judge of the rightness of every deed and thought.¹⁹ There will be no determinate human superior. The only recognised sovereign will be moral authority. Coercion, which is the offspring of violence, will be totally extinct. People will voluntarily co-operate. They may form associations for the satisfaction of their various needs. Membership to these associations will be open to all. While one is its member, one must abide by

its rules, for by the very act of joining an association one accepts to obey its rules. In case one violates them he can be penalised for "an organisation has every right to prescribe penalties for a breach by its members of self-imposed conditions".²⁰ But since at the same time an organisation exists for the individual and not *vice versa*, a member, in case he finds the rules irksome, must be free to leave the association. In no case must compulsion or coercion be used. Coercion must give way in every case to conversion.

No Need for Institutions

The non-violent society will be free from police and law courts. These will simply not be needed. But to understand this it becomes necessary to examine Gandhiji's view on human nature. According to Gandhiji no man is wicked by nature. No doubt in the actual world we do find wicked and violent men. But they were not born bad; they became so; were, in fact, made so by the prevalent conditions and injustices. Gandhiji categorically stated that it was more natural for man to be good than evil. Even in the so called wicked people there lay concealed the spark of divine goodness; only that spark needed to be kindled and it would burst forth into bright and brilliant flames. "I have been taught from childhood and I have tested the truth by experience that the primary virtues of mankind are capable of cultivation, by the meanest of human species. It is this undoubted universal possibility that distinguishes the human from the rest of God's creation."²¹ In this respect Gandhiji strictly adhered to the *Advaita* philosophy which believes in the absolute oneness of God and humanity. Therefore, given the opportunity every individual has the same possibility for spiritual growth. "The soul is one in all. Its possibilities are therefore the same for everyone." In general Gandhiji's position regarding human nature is this: Man is by nature good, while those who are wicked today are capable of becoming good and in fact some day will.

This being so, in the ideal society

where all men will be good the need for police courts will not arise, for there will be hardly any quarrels or conflicts. The main causes of conflict are distrust, suspicion and greed. But in the ideal society there will be no suspicion, and suspicion according to Gandhiji is "the brood of violence".²² Instead of suspicion there will be mutual trust and love for all. Every inhabitant of India will regard every other as his brother or sister. Every man will have conquered lust, for "without overcoming lust man cannot hope to rule over self; and without rule over self, there can be no *Swaraj* or *Ramraj*". In other words, the term *swaraj* connotes not merely self rule but also self-restraint. Guided by the principle of love for all, men will practise the maximum of selflessness and since theoretically where there is perfect love there will be perfect non-possession, in the ideal society there will be the total absence of greed or lusts of any kind.

With love residing in the hearts of all men the problem of justice was expected to be automatically solved. Men would rarely do wrong. "Where the law of *ahimsa* reigns supreme, there should be no jealousy, no unworthy ambition, no crime." And if they did wrong they would willingly admit it and be given justice based on love. And justice that love gives, according to Gandhiji, is surrender, while the justice that law gives is a punishment.²³ Gandhiji did not believe in going to law courts to obtain justice. "We win justice best by rendering justice to the other party." Should disputes arise they should be settled amicably; should one commit an offence one must voluntarily plead guilty and willingly suffer the penalty imposed by the justice based on love. But to go to the modern law-court was to perpetuate ill-feeling and create further bad-blood. Besides courts roused our baser self; they tempted witnesses to sell their souls for money or for friendship's sake, and worst of all they supported the authority of a government.²⁴ Today we consider the courts as the indispensable guardians of our rights; we are obsessed with the problem of protecting our liberties. But we forget that all rights and liberties are the consequence of duties per-



formed. "If we all discharge our duties, rights will not be far to seek. (But) if leaving duties unperformed we run after rights, they will escape us like a Will-o'-the-Wisp". Now the principle of love teaches us not to hanker after rights but perform our duties. In the ideal society, therefore, since the principle of love reigns supreme, all men will do their duties, rights and liberties will then automatically follow. The question of going to law courts for the protection of one's rights will therefore, not arise at all.

In the predominantly non-violent state, however, a police squad and prison may be necessary. But the police and prison would be of a totally different nature from what they are today. Since "all crimes are different kinds of diseases", Gandhiji argued that they should be treated as such. Hence all prison houses should be converted into reformatories; while the duty of policemen should not primarily be catching culprits who had committed wrong but rather elimination of those conditions which were responsible for the commission of crime.

Decentralization

Economically the ideal society will be completely decentralised. Decentralisation is the logical adjunct of the non-violent philosophy, for "centralisation cannot be sustained and defended without adequate force". The village will be the key-unit of the new society. And every village will be completely self-sufficient and autonomous. It will be capable of managing all its affairs itself, even to the extent of defending itself against the world. "When our villages are fully developed, there will be no dearth in

them of men with a high degree of skill and artistic talent. There will be village-poets, village artists, village architects, linguists and research workers. In short, there will be nothing in life worth having which will not be had in the villages. Today villages are dung-heaps. Tomorrow they will be like tiny gardens of Eden where dwell highly intelligent folk whom no one can deceive or exploit.”²⁵ The same principle of love and *ahimsa*, which is relied upon to maintain order and peace as between individuals is now relied upon to maintain inter-village harmony.

But, for the immediately practicable purpose (that is in the case of the predominantly non-violent society) Gandhiji had no objection to a federation of villages. Thus he spoke of the “village, taluka, district and provincial panchayats ultimately federating into an All-India Panchayat” provided that the control exercised by the higher panchayat over the lower was purely moral and not coercive; its function advisory and co-operative and not authoritarian and dictatorial.

In the ideal society there will be complete equality. Everyone will earn an honest living by the sweat of his brow. There will be no distinction between intellectual and manual labour. Gandhiji held equality to be implicit in the concept of *Ramrajya*. “There can be no *Ramrajya* in the present state of inequalities in which a few roll in riches and the masses do not get enough to eat.”²⁶ Even the very term *samaj* springs from the root-word *sam* meaning equal. Monopolies were ruled out, for they not only implied concentration of wealth but also the creation of privileges.

The Simple Life

The ideal society will be characterised by primitive simplicity. It will be built on the principle of simple living and high thinking. But high thinking is inconsistent with “the complicated material life based on high speed imposed on us by mammon worship”.²⁷ Hence the ideal society will be free from all such complexities of modern civilization as large-scale production, heavy production, heavy transport,

and even the modern system of medicine. In the *Economics of Village Industries* Gandhiji argued that the system of large-scale production makes man subservient to the machine. It is not the needs of man that dictate how much shall be produced; the machines themselves dictate how much shall be produced so that they can be run with profit to the owner. In the *Hind Swaraj* Gandhiji’s main grudge against the machine is that it is the symbol of the enslavement of human beings. Production by large machines not only reduces the worker to an automaton; it also creates iniquities and leads to exploitation.

For these same reasons Gandhiji ruled out industrialisation. In the *Harijan* of 29-9-1940, he wrote: “Pandit Nehru wants industrialisation because he thinks that, if it is socialised, it would be free from the evils of capitalism. My own view is that the evils are inherent in industrialism and no amount of socialisation can eradicate them.” Hence in the ideal society production will be done in small units. All industries will be cottage industries. The *charkā** will be given a place of special importance. It will not only restore our villages to their rightful place but will also abolish the distinction between high and low. And only such other machines will be allowed as will neither create unemployment nor cause exploitation.

There will be no heavy transport, for, since every village will be self-sufficient there will be little occasion for exchange. In the *Hind Swaraj* Gandhiji’s argument against the railways bordered on the fantastic: “It must be manifest to you that but for the railways, the English would not have such a hold on India as they have. The railways, too, have spread the bubonic plague — without them, the masses would not move from place to place. They are the carriers of plague-germs. Railways have also increased the frequency of famines because owing to facility of means of locomotion, people sell out their grains and it is sent to the dearest markets. . . . Railways accentuate the evil nature of man. Bad men fulfil their evil

designs with greater rapidity. Formerly people went to these (holy) places with great difficulty. Generally, therefore, only the real devotees visited such places. Now-a-days rogues visit them in order to practise their roguery.”

Medicine

The modern system of medicine will also not be required, for once individuals acquire perfect self-control, and do regular manual labour to earn their bread, their health will keep trim, and diseases which invariably originate from sloth and over-indulgence will disappear. Doctors and hospitals do a positive ill-service by curing diseases and thus encouraging self-indulgence. Hospitals are institutions for propagating sin. Men take less care of their bodies and immorality increases. European doctors are worst of all. For the sake of a mistaken cure of the human body, they kill annually thousands of animals. They practise vivisection. No religion sanctions this. All say that it is not necessary to take so many lives for the sake of our bodies.”²⁸

As to the place of religion in the non-violent society, Gandhiji, (unlike Bakunin and Kropotkin) gave it a place of hallowed importance. In fact one of the names he gave to the ideal society is *Ramraj* or the Kingdom of God. However, this does not imply the creation of a theocratic state. The question of a theocratic state does not arise for the non-violent society is to be a stateless society. All that *Ramraj* implies is that each individual will be free to follow any religion (conventional) of his choice. And all religions according to Gandhiji are built on the same substratum of fundamental ethics.

Armaments

Finally, the ideal society will not require armies, planes or ships to defend it. The idea of maintaining armed forces for the purpose of defence is ruled out by definition. How can the non-violent society be expected to defend itself by the use of violence? But then it may be asked, “What must the non-violent society do when confronted fact to face with an aggressor?”

* Spinning Wheel.

Gandhiji's answer is, it must offer passive resistance, that is, it must not take up arms against the invader but must refuse him co-operation. "Thus supposing that a modern edition of a Nero descended upon India, the representatives of the state will let him in but tell him that he will get no assistance from the people."²⁹ This method was tried out in France when after the German invasion, the French Civil Service, by refusing to co-operate with the conquerors, almost paralysed administration by their go-slow tactics. Since 1930 India herself adopted this method against the British government. If, however, the aggressor insists on aiming his guns at the non-violent registers, the people must willingly offer themselves as fodder for the invader's cannon. And it was Gandhiji's firm belief that if the method of non-co-operation did not succeed in converting the heart of the aggressor then that of willingly courting death surely would. "The unexpected spectacle of endless rows upon rows of men and women simply dying rather than surrendering to the will of an aggressor must ultimately melt him and his soldiery."

Philosophical Anarchism

We have thus seen what *swaraj* meant to Gandhiji. It stood for philosophical anarchism, for that state of society when each man rules himself and is never a hindrance to his neighbour; in which the only sovereign recognized is moral authority. Political self-government to Gandhiji meant individual self-government.

Now the way or the means to this ideal society is to be dictated by the nature of the end itself. Gandhiji would have no divorce between the ends and the means. The complete identification of the ends and the means is markedly noticeable in the many definitions of freedom (*swaraj*) that Gandhiji gave from time to time as "Khadi is *swaraj*", "Hindu Muslim unity is *swaraj*", "the abolition of untouchability is *swaraj*". In fact the means adopted determine the end. If we adopt good means, good results must follow. "The mean is like the seed, the end like the tree." This

belief constituted one of the reasons for Gandhiji's refusing to see far into the future. "Let me see to my present means, the future will take care of itself; one step is enough for me" — this was his logic. Here also we see the influence of the *Gita* which teaches us to make the effort and refrain from worrying about the results. If we adopt *ahimsa* as the means towards *swaraj*, we need not worry about the exact nature of *swaraj*. That will take care of itself. And the more pure the ends the faster will be our progress towards the goal.³⁰

There were certain ethico-religious reasons also as to why Gandhiji favoured the non-violent means. How can man, he argued, who had not the power of creation, claim the right to destroy even the meanest of creatures that live. Further how can genuine conversion be brought forth by force. One cannot eradicate evil from the human breast at the point of the bayonet, for, the human breast just does not lend itself to such means.

Swaraj

Hence Gandhiji never tired of preaching to his fellow countrymen that *swaraj* could only be obtained by non-violence. By violence we may rid ourselves of British rule but not acquire *swaraj*, for, that term essentially implies individual freedom and love neither of which can ever be the produce of violence. The natural corollary of violence is the suppression of extermination of the antagonist, argued Gandhiji, hence violent means can hardly make for individual freedom.³¹ *Swaraj* born of violence and hatred is not worth having, for, that which is born of violence will need violence to maintain it. "What *swaraj* will be worth if it is gained through violence? It will be an ill-gotten *swaraj* where violence born of hatred which is death reigns and where love, which is life, lies bleeding." If, therefore, we wish to achieve true *swaraj* we must work through truth and non-violence; we must build, gradually and steadily, from the bottom upwards by constructive effort. The tactics adopted by the Western anarchists, bomb-throwings, political murders, (anarchism by deed) were



ruled out, for "non-violent strength comes from construction, not destruction".³²

Ahimsa

Hence *ahimsa* is to be the *paramo-dharma*, the highest value or the prime duty. As such it is applicable to all. *Ahimsa* is even the religion of the Kshatriya for *ahimsa* is the extreme limit of forgiveness. But forgiveness is the quality of the brave. Hence *ahimsa* is the way of the brave ready to face death. "Man lives freely only by his readiness to die, if need be at the hands of his brother, never by killing him." Once when the Rajputs of Kathiawad asked Gandhiji, whether he had come to make them give up their swords, he replied, that he did not desire them to do any such thing. They could possess a trusty sword as long as they believed in it. "But I certainly told them that my ideal Rajput was he who defended without the sword and who died on his post without killing."³³ *Ahimsa* connotes not only non-violence, but also truthful conduct, for only a truthful man can be a genuine votary of non-violence. In fact, Gandhiji first went in search of truth, in the process he alighted on non-violence. If truth was the door, non-violence was the key that opened it. At the Savali conference, when Gandhiji was asked which of the two, truth or non-violence, was more important, he replied that each entailed the other and that they constituted an integral product. Hence, the principle of *ahimsa* is violated by telling lies. It is also violated if one harbours evil thoughts, wishes ill to another, dis-

plays anger, exhibits pride or seeks to hold on to what the world needs. "Anger is the enemy of *ahimsa* and pride is the monster that swallows it up."³⁴

Ahimsa when given a practical shape takes the form of *satyagraha*. *Satyagraha* is *ahimsa* in practice. It means "vindication of truth not by infliction of suffering on the opponent, but one's own self". It is the science and art of overcoming evil with good.

Satyagraha

The idea of *satyagraha* is inspired by the ideal family. In the ideal family disputes are settled by the law of love. If a member feels he is injured or done wrong to, he suffers the wrong or injury without retaliation and without becoming angry. He does this because he has great affection and regard for others. In trivial matters, therefore, he willingly agrees with the rest of the family. Only in case of vital issues does he try to persuade and convince others and in the process, if necessary, silently suffers rather than cause suffering to others. This is the meaning of the statement "the law of love silently but surely governs the family". Now *satyagraha* is nothing else but the extension of this rule of domestic life to the political; it is the introduction of the family virtues of truth and gentleness into the political arena. Hence it is necessary for the *satyagrahi* to remember certain things. The *satyagrahi* aims at conversion, consequently he must never think in terms of coercion, threat or intimidation, "There can be no coercion in *swaraj*. A non-co-operator or his associate who uses coercion has no apology whatsoever for his criminality."³⁵ No one must be forced or awed into giving for what is granted under fear can be retained only so long as the fear lasts. Secondly the *satyagrahi* must never forget the distinction between the evil and evil doer. His aim is to eradicate the evil not destroy the doer of evil; the latter instead of being destroyed must be converted.

Gandhiji sincerely believed that

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the non-violent means would succeed. In 1938 he wrote: "I believe in the ancient saying that non-violence real and complete will melt the stoniest hearts". In one of his letters to the Viceroy, written just before the launching of a *satyagraha*, Gandhi said: "My ambition is no less than to convert the British people through non-violence and thus make them see the wrong they have done to India."³⁶ The same holds true for the rich and monied people. They are not to be frightened or forced into giving their wealth, but are to be convinced to hold their surplus wealth as trust property. The voluntary suffering of the *satyagrahi* is bound to arouse the innate goodness even in the most brutal men. That is why Gandhiji advised the Jews to practise non-violence against Hitler's troops, for, if they had organised such a non-violent resistance, even the stoniest Nazi hearts would have melted. The belief that "brute nature has been known to yield to the influence of love", enabled him to say that *satyagraha* is not compulsion, but its opposite for it merely appeals to the conscience of the evil doer who gradually comes to realise his folly.

Gandhiji practised the means he preached. Never once did he resort to violence. He relied mainly on appeals. These he issued from time to time, such as "an appeal to every Briton", "the Indian Franchise: an appeal" and others. Almost every issue of his *Young India* or the *Harijan Sevak* carried some appeal or the other. In addition to "appeals", Gandhiji also relied on the Tolstoyan technique of conversion by precept or example. He always preached to his *satyagrahis* to set the example of goodness and love, for, the inherent qualities of these virtues would then attract others into adopting them also.

Thus the Gandhian means towards the anarchist goal of a stateless society did not contemplate the deliberate destruction of the state machine. All that was needed to make the state disappear was the progressive observance of non-violence. The more a society becomes non-violent, the lesser the need for the state, and when finally the society becomes fully non-

violent the state will completely disappear.

To conclude this chapter, we find that in Gandhiji's political philosophy there are three distinct ideas:

The first is that the present state is based on violence.

The second is the predominantly non-violent state which is a sort of a *via media* or the transitional state.

The third is the ideal non-violent state or *Ramraj* in which there will be no stateal authority whatsoever.

The last, Gandhiji claimed was an unattainable ideal and so for the present he was concerned with establishing the second. "If India becomes free in my life time," wrote the Mahatma in 1940, "and I have still energy left in me, of course I would take my due share, though outside the official world, in building up the nation on a strictly non-violent basis". But the ideal or the ultimate goal to be aspired at and striven towards remained philosophical and moral anarchism. And it must be said to the credit of Gandhiji that up to the very end he stuck to his ideals. When in 1920 Gandhiji demanded from the British *swaraj* of the parliamentary type it was naturally believed in many quarters that Gandhiji had retracted his views since he wrote *Hind Swaraj* in 1908 vitriolically condemning parliamentary government. But this was not so. In the *Young India* of 18th December 1920, Gandhiji wrote: "I adhere to all I have said in that booklet and I would certainly recommend it to the reader; government over self is the truest *swaraj*, it is synonymous with *moksha* or salvation and I have seen nothing to alter the view that doctors, lawyers and railways are no help and are often a hindrance to the one thing worth striving after." But although the Mahatma confessed that his convictions had not changed and that "I am individually working for the self rule pictured therein" he was also at the same time forced to admit that "my corporate activity is undoubtedly devoted to the attainment of parliamentary *swaraj* with the wishes of the people". And this was only befitting the Mahatma who had never put faith in the

technique of coercion but had always sought to realise his aspirations by changing hearts.

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8. *Vide Young India*: 29.1.1925.
9. *Ibid*, 15.12.1921 and 18.3.1919.
10. *Harijan*: 1.2.1942.
11. *Young India*: 9.12.1926.
12. *Young India*: 8.12.1921.
13. *From Socialism to Sarvodaya*, p.29.
14. *Harijan*: 25.1.1942.
15. *Young India*: 13.8.1925.

This month's authors

B. B. Vohra

Is additional Secretary to the Government of India Ministry of Agriculture and Irrigation. He is the author of *A Charter for the Land*.

Dr. M.S. Swaminathan

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Is a graduate of Bombay University and has been a lecturer on Political Science at the University of Marathwada. His publications include many articles on Gandhi's Sarvodaya philosophy.

J. C. Kapur

Is a futurologist and a student of Indian society. His predominant passion is appropriate technology with which he has ingeniously equipped his own very impressive farm just outside New Delhi.

16. *Hind Swaraj*, pp.80-1. In 1937 when Gandhiji advocated the going of Congressmen to legislatures, he naturally exposed himself to the criticism on going back on his words. His reply was that this was not so. "The boycott of legislatures, let me tell you, is not an external principle like that of truth or non-violence. My opposition to them has considerably lessened, but that does not mean that I am going back on my former position. The question is purely one of strategy ... (*Harijan*: 1 May 1937.)
17. Quoted in Dhawar's *Political Philosophy of Mahatma Gandhi* pp.90-92.
18. *Young India*: 27.10.1920.
19. *Ethical Religion*, p.41.
20. *Young India*: 10.7.1924.
21. *Harijan*: 16.5.1936.
22. *Young India*: 4.6.1925.
23. *Young India*: 9.7.1925.
24. *Young India*: 6.10.1920.
25. *Harijan*: 28.7.1946.
26. *Harijan*: 1.6.1947.
27. *Harijan*: 1.9.1946.
28. *Hind Swaraj*: pp.58-9.
29. *Harijan*: 13.5.1960.
30. *Vide Amrit Bazar Patrika*: 17.9.1933.
31. *Harijan*: 27.5.1939.
32. *Harijan*: 25.1.1942, *Vide also* 27.5.1939.
33. *Young India*: 22.9.1927.
34. *Young India*: 21.10.1926; also see *Yerwada Mandir*.
35. *Young India*: 24.11.1921.
36. Quoted in E.M.S. Namboodiripad's: *The Mahatma and the Ism*, p.56.

Excerpts from the Writings and

The following excerpts which include some from Gandhi's closest followers — Vinoba Bhave, J. P. Narayan, V. G. Dasai, Mirabehn and the Rev. J. C. Andrews are intended to provide some idea of Gandhian social and ecological philosophy and its extraordinary relevance to the problems of today.

It is hoped that they might lend some credence to the view shared by most of those associated with this journal, that Gandhism will be the first great movement of the Post-Industrial age.

A Dynamic Philosophy

I would like to say to the diligent reader of my writings and to others who are interested in them, that I am not at all concerned with appearing to be consistent. In my search after Truth I have discarded many ideas and learnt many new things. Old as I am in age, I have no feeling that I have ceased to grow inwardly or that my growth will stop at the dissolution of the flesh. What I am concerned with is my readiness to obey the call of Truth, my God, from moment to moment, and therefore, when anybody finds any inconsistency between any two writings of mine, if he has still faith in my sanity, he would do well to choose the later of the two on the same subject.

Harijan 29.4.33. p.2.

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Ahimsa

Passive Resistance is the religion of *Ahimsa*. It is, therefore, everywhere and always a duty and is desirable. Even the devotees of methods of violence impose elaborate restrictions upon their use. Passive Resistance admits of no such limits. It is limited only by the insufficiency of the passive resister's strength to suffer.

Speeches and Writings of M. Gandhi, p.192.

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Because underlying Ahimsa is the unity of all life, the error of one cannot but affect all, and hence man cannot be wholly free from Himsa. So long as he continues to be a social being, he cannot but participate in the Himsa that the very existence of society involves.

Autobiography 1948, p.428.

* * *

Ahimsa is a comprehensive principle. We are helpless mortals caught in the conflagration of Himsa. The saying that life lives on life has a deep meaning in it. Man cannot for a moment live without consciously or unconsciously committing outward Himsa. The very fact of his living-eating, drinking and moving about — necessarily involves some Himsa, destruction of life, be it ever so minute. A votary of Ahimsa therefore remains true to his faith if the spring of all his actions is compassion, if he shuns to the best of his ability the destruction of the tiniest creature, tries to save it, and thus incessantly strives to be free from the deadly coil of Himsa. He will be constantly growing in self-restraint and compassion, but he can never become entirely free from outward Himsa.

Autobiography 1948, pp.427-28.

* * *

One thing is certain, If the mad race for armaments continues, it is bound to result in slaughter such as has never occurred in history. If there is a victor left the very victory will be a living death for the nation that emerges victorious. There is no escape from the impending doom save through a bold and unconditional acceptance of the non-violent method with all its glorious implications.

The Mind of Mahatma Gandhi. O.U.P. 1945

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* *Ahimsa: Non-violence towards all living things*

Speeches of Mahatma Gandhi

Satyagraha

*Satyagraha** in its dynamic condition means conscious suffering. It does not mean meek submission to the will of the evil-doer, but it means the pitting of one's whole soul against the will of the tyrant. Working under this law of our being, it is possible for a single individual to defy the whole might of an unjust empire to save his honour, his religion, his soul and lay the foundation for that empire's fall or its regeneration.

Young India, 11.8.20.

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To fight with the sword does call for bravery of a sort. But to die is braver far than to kill. He alone is truly brave, he alone is martyr in the true sense, who dies without fear in his heart and without wishing hurt to his enemy, not the one who kills and dies. If our country, even in its present fallen state, can exhibit this type of bravery, what a beacon light will it be for Europe with all its discipline, science and organisation!

A Pilgrimage for Peace, p.56.

* * *

I hold that Non-co-operation is of universal use.

Well applied, its use in politics can wholly displace the use of barbarous weapons of mutual destruction. The thing to do, therefore, is not to restrict its use, but to extend it, care being taken that it is used in accordance with the known laws regulating its use. Risk of misuse has undoubtedly to be run. But with the increase in the knowledge of its right use, the risk can be minimized.

Young India, 15.12.21.

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Swaraj

The word Swaraj is a sacred word, a Vedic word, meaning self-rule and self-restraint, and not freedom from all restraint which 'independence' often means.

As every country is fit to eat, to drink and to breathe, even so is every nation fit to manage its own affairs, no matter how badly.

Young India, 15.10.31.

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By Swaraj I mean the government of India by the consent of the people as ascertained by the largest number of the adult population, male or female, native born or domiciled, who have contributed by manual labour to the service of the State and who have taken the trouble of having their names registered as voters. I hope to demonstrate that real Swaraj will come not by the acquisition of authority by a few but by the acquisition of the capacity by all to resist authority when abused. In other words, Swaraj is to be attained by educating the masses to a sense of their capacity to regulate and control authority.

Young India, 29.1.25.

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My idea of village Swaraj is that it is a complete republic, independent of its neighbours for its own vital wants, and yet interdependent for many others in which dependence is a necessity. Thus every village's first concern will be to grow its own food crops and cotton for its cloth. It should have a reserve for its cattle, recreation and playground for adults and children. Then if there is more land available, it will grow *useful* money crops, thus excluding *ganja*,* tobacco, opium and the like. The village will maintain a village theatre, school and public hall. It will have its own waterworks ensuring clean water supply. This can be done through controlled wells or tanks. Education will be compulsory up to the final basic course. As far as possible every activity will be conducted on the co-operative basis. There will be no castes such as we have today with their graded untouchability. Non-violence with its technique of Satyagraha and non-co-operation will be the sanction of the village community. There will be a compulsory service of village guards who will be selected by rotation from the register maintained by the village. The government of the village will be

**Satyagraha: Non-violent resistance*

conducted by the Panchayat of five persons annually elected by the adult villagers, male and female, possessing minimum prescribed qualifications. These will have all the authority and jurisdiction required. Since there will be no system of punishments in the accepted sense, this Panchayat will be the legislature, judiciary and executive combined to operate for its year of office. Any village can become such a republic today without much interference, even from the present Government whose sole effective connection with the villages is the exaction of the village revenue. I have not examined here the question of relations with the neighbouring villages and the centre if any. My purpose is to present an outline of village government. Here there is perfect democracy based upon individual freedom. The individual is the architect of his own government. The law of non-violence rules him and his government. He and his village are able to defy the might of a world. For the law governing every villager is that he will suffer death in the defence of his and his village's honour.

Harijan, 26.7.42.

* * *

Panchayat has an ancient flavour; it is a good word. It literally means an assembly of five elected by villagers. It represents the system, by which the innumerable village republics of India were governed. But the British Government, by its ruthlessly thorough method of revenue collection, almost destroyed these ancient republics, which could not stand the shock of this revenue collection. Congressmen are now making a crude attempt to revive the system by giving village elders civil and criminal jurisdiction. The attempt was first made in 1921. It failed. It is being made again, and it will fail if it is not systematically and decently, I will not say, scientifically, tried.

Harijan, 11.8.40.

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In this structure composed of innumerable villages, there will be ever widening, never ascending, circles. Life will not be a pyramid with the apex sustained by the bottom. But it will be an oceanic circle whose centre will be the individual always ready to perish for the circle of villages, till at last the whole becomes one life composed of individuals, never aggressive in their arrogance but ever humble, sharing the majesty of the oceanic circle of which they are integral units.

Therefore, the outermost circumference will not wield power to crush the inner circle but will give strength to all within and derive its own strength from it.

Harijan, 28.7.46.

* * *

Gandhiism succeeds where Marxism fails. Gandhi recognises that man requires both food and freedom. Not only should there be common ownership of property, but there should be love, sympathy, kindness and co-operation also. Such a combination of food and freedom we already find in family relations. So Gandhi's approach to the problem is not from the side of governments and markets but from the side of the individual and the family. Gandhi and Vinoba recommend 'familization' of society instead of socialization of property. Whereas familization includes common ownership of property, socialization may not contain freedom and personal relationships. Familization puts together the means by which man can live and live well also. It sets aside both capitalism and dictatorship.

Gora. Why Gramraj?*

* * *

We won independence with the power of Ahimsa. Other countries had to adopt violent techniques for it. But if we do not take the step to achieve social and economic freedom, verily our Independence is in danger. To achieve this we shall have to follow the decentralized technique of God. Through co-operative institutions we will have to control economic activities. Had there been no decentralization in God's planning, he might have been obliged to travel from Bombay to Calcutta, Calcutta to Delhi, and so on. But he gave two eyes, two hands and two ears to everybody to co-operate with one another. Had he given four eyes and no ears to one, and four ears and no eyes to another, the former would have had to take the help of the latter to hear; and the latter of the former to see. If this had been so the Almighty would not have enjoyed so care-free a sleep in Kshirasagar as He is said to be taking today. We must understand the principle and beauty underlying this pattern of co-operation.

Vinoba Bhawe. Bhoodan Yajna.

* * *

Swaraj and Gramraj

As I look at it, there are two entirely different concepts of society involved here. Even though not clearly expressed, this is implicit throughout Gandhiji's discussion on the subject. One concept is that put forward by Dr. Ambedkar, and accepted as the basis of the Constitution, namely the atomised and inorganic view of society. It is this view that governs political theory and practice in the West today. The most important reason for that is that Western society itself has become, as a result of a certain form of industrialisation and economic order, an atomised mass society. Political theory and practice naturally reflect this state of

**Gora, the author of 'An Athiest with Gandhi' died in August this year.*

affairs, and political democracy is reduced to counting of heads. It is further natural in these circumstances for political parties, built around competing power-groups, to be formed, leading to the establishment, not of government by people, but of government by party; in other words, by one or another power-group.

The other is the organic or communitarian view that puts man in his natural milieu as a responsible member of a responsible community. This view treats man not as a particle of sand in an organic heap, but as a living cell in a larger organic entity. It is natural that, in this view, emphasis should be laid more on responsibility than on right, just as in the inorganic view it is natural that it should be the opposite. When the individual lives in community with others, his rights flow from his responsibilities. It cannot be otherwise. That is why, in Gandhiji's sociological thought, the emphasis is always laid upon responsibility.

Western democracy will perhaps solve its own internal problems, but it must be emphasised that the western concept of democracy as government by consent or, in other words, as a political system that offers an opportunity to the people to change their government peacefully, is not an adequate concept, and that we should profit from the experience of the west and try to move forward towards a more adequate democracy. The next step beyond government by consent is people's participation in government, or a *participating democracy*.

J.P. Narayan, *Communitarian Society and Panchayati Raj*.

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Swadeshi

After much thinking I have arrived at a definition of *Swadeshi* that, perhaps, best illustrates my meaning. *Swadeshi* is that spirit in us which restricts us to the use and service of our immediate surroundings to the exclusion of the more remote. Thus, as for religion, in order to satisfy the requirements of the definition, I must restrict myself to my ancestral religion. That is the use of my immediate religious surrounding. If I find it defective, I should serve it by purging it of its defects. In the domain of politics, I should make use of the indigenous institutions and serve them by curing them of their proved defects. In that of economics, I should use only things that are produced by my immediate neighbours and serve those industries by making them efficient and complete where they might be found wanting. It is suggested that such *Swadeshi*, if reduced to practice, will lead to the millennium, because we do not expect quite to reach it within our times, so may we not abandon *Swadeshi* even though it may not be fully attained for generations to come.

Speeches & Writings of M. Gandhi, p. 336

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Just as the cult of patriotism teaches us today that the individual has to die for the family, the family has to die for the village, the village for the district, the district for the province, and the province for the country, even so a country has to be free in order that it may die, if necessary, for the benefit of the world. My love, therefore, of nationalism or my idea of nationalism is that my country may become free, that, if need be, the whole of the country may die, so that the human races may live. There is no room for race hatred there. Let that be our nationalism.

Young India: Sept. 10, 1925

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I would urge that *Swadeshi* is the only doctrine consistent with the law of humility and love. It is arrogance to think of launching out to serve the whole of India when I am hardly able to serve even my own family. It were better to concentrate my effort upon the family and consider that through them I was serving the whole nation and, if you will, the whole of humanity.

Speeches & Writings of M. Gandhi, p. 350

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The vow of *Swadeshi* is a necessary vow . . . I suggest to you we are departing from one of the sacred laws of our being when we leave our neighbour and go out somewhere else in order to satisfy our wants. If a man comes from Bombay here and offers you wares, you are not justified in supporting the Bombay merchant or trader so long as you have got a merchant at your very door, born and bred in Madras. That is my view of *Swadeshi*. In your village is a barber, you are bound to support him to the exclusion of the finished barber who may come to you from Madras. If you find it necessary that your village barber should reach the attainments of the barber from Madras, you may train him to that. Send him to Madras by all means, if you wish, in order that he may learn his calling. Until you do that, you are not justified in going to another barber. That is *Swadeshi*. So, when we find that there are many things that we cannot get in India, we must try to do without them. We may have to do without many things which we may consider necessary; but believe me, when you have that frame of mind, you will find a great burden taken off your shoulders, even as the Pilgrim did in that inimitable book, *Pilgrim's Progress*.

Speeches & Writings of M. Gandhi, p. 385

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We do not realize that *Swaraj* is almost wholly obtainable through *Swadeshi*. If we have no regard for our respective vernaculars, if we dislike our clothes, if our dress repels us, if we are ashamed to wear the sacred shikha, if our food is distasteful to us, our climate is not good enough, our people uncouth and unfit for our company, our civilization faulty and the foreign attractive, in short, if everything native is bad and everything foreign pleasing to us, I should not know what *Swaraj* can mean for us. If everything foreign is to be adopted, surely it will be necessary for us to continue long under foreign tutelage, because foreign civilisation has not permeated the masses. It seems to me that, before we can appreciate *Swaraj*, we should have not only love but passion for *Swadeshi*.

Speeches & Writings of M. Gandhi, p. 414

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Much of the deep poverty of the masses is due to the ruinous departure from *Swadeshi* in the economic and industrial life. If not an article of commerce had been brought from outside India, she would be today a land flowing with milk and honey. But that was not to be. We were greedy, and so was England. The connection between England and India was based clearly upon an error. But she does not remain in India in error. It is her declared policy that India is to be held in trust for her people. If this is true, Lancashire must stand aside. And if the *Swadeshi* doctrine is a sound doctrine, Lancashire can stand aside without hurt, though it may sustain a shock for the time being.

It has often been urged that India cannot adopt *Swadeshi* in the economic life at any rate. Those who advance this objection do not look upon *Swadeshi* as a rule of life. With them it is a mere patriotic effort not to be made if it involved any self-denial. *Swadeshi* as defined here, is a religious discipline to be undergone in utter disregard of the physical discomfort it may cause to individuals. Under its spell, the deprivation of a pin or a needle, because these are not manufactured in India, need cause no terror. A *Swadeshist* will learn to do without hundreds of things which today he considers necessary. Moreover, those who dismiss *Swadeshi* from their minds by arguing the impossible, forget that *Swadeshi*, after all, is a goal to be reached by steady effort. And we would be making for the goal even if we confined *Swadeshi* to a given set of articles, allowing ourselves as a temporary measure to use such things as might not be procurable in the country.

Speeches & Writings of M. Gandhi, p. 386

The Economics of the Charkha

A hundred and fifty years ago, we manufactured all our cloth. Our women spun fine yarns in their own cottages, and supplemented the earnings of their husbands. The village weavers wove that yarn. It was an indispensable part of national economy in a vast agricultural country like ours. It enabled us in a most natural manner to utilize our leisure. Today our women have lost the cunning of their hands, and the enforced idleness of millions has impoverished the land. Many weavers have become sweepers. Some have taken to the profession of hired soldiers. Half the race of artistic weavers has died out, and the other half is weaving imported foreign yarn for want of finer hand-spun yarn.

You will perhaps now understand what boycott of foreign cloth means to India.

Young India: July 13, 1921

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The spinning wheel represents to me the hope of the masses. The masses lost their freedom, such as it was, with the loss of the *charkha*. The *charkha* supplemented the agriculture of the villagers and gave it dignity. It was the friend and solace of the widow. It kept the villagers from idleness. For the *charkha* included all the anterior and posterior industries — ginning, carding, warping, sizing, dyeing and weaving. These in their turn kept the village carpenter and the blacksmith busy. The *charkha* enabled the seven hundred thousand villages to become self-contained. With the exit of the *charkha* went the other village industries, such as the oil press. Nothing took the place of these industries. Therefore the villages were drained of their varied occupations and their creative talent and what little wealth these brought them.

Hence, if the villagers are to come into their own, the most natural thing that suggests itself is the revival of the *charkha* and all it means.

This revival cannot take place without an army of selfless Indians of intelligence and patriotism working with a single mind in the villages to spread the message of the *charkha* and bring a ray of hope and light into their lustreless eyes. This is a mighty effort at co-operation and adult education of the correct type. It brings about a silent and sure revolution like the silent but sure and life-giving revolution of the *charkha*.

Harijan, 13.4.40

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The *Charkha* is the symbol of the nation's prosperity and, therefore, freedom. It is a symbol not of commercial war, but of commercial peace. It bears not a message of ill-will towards the nations of the earth, but of goodwill and self-help. It will not need the protection of navy threatening a world's peace and exploiting its resources, but it needs the religious determination of millions to spin their yarn in their own homes as today they cook their food in their own homes. I may deserve the curses of posterity for many mistakes of omission and commission, but I am confident of earning its blessings for suggesting a revival of

the *Charkha*. I stake my all on it. And with all that, inasmuch as the loss of it brought about India's slavery, its voluntary revival with all its implications must mean India's freedom.

Young India: Dec. 8, 1921

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It would be sinful for me to dismiss a highly paid faithful servant because I can get a more efficient and cheaper servant, although the latter may be equally faithful. The economics that disregard moral and sentimental considerations are like wax works, that, being life-like, still lack the life of the living flesh. At every crucial moment, these new-fangled economic laws have broken down in practice. And nations or individuals who accept them as guiding maxims must perish. There is something noble in the self-denial of the Mussalman who will pay more for food religiously prepared, or a Hindu who will decline to take food unless it is ceremonially clean. We lost when we began to buy our clothing in the cheap markets of England and Japan. We will live again, when we appreciate the religious necessity of buying clothes prepared by our own neighbours in their cottages.

Young India: Oct. 27, 1921

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Free trade for a country which has become industrial, whose population can and does live in cities, whose people do not mind preying upon other nations and, therefore, sustain the biggest navy to protect their unnatural commerce, may be economically sound (though, as the reader perceives, I question its morality). Free trade for India has proved her curse and held her in bondage.

Young India: Dec. 8, 1921

Agriculture and Land Management

In India we have got many millions of people who have to be satisfied with one meal a day and that meal consisting of a Chapati containing no fat in it and a pinch of salt. You and I have no right to anything that we really have until these millions are clothed and fed. You and I ought to know better, must adjust our wants, and even undergo voluntary privation in order that they may be nursed, fed and clothed.

Mahatma Gandhi (1918), p.189

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The first lesson we must learn is of self-help and self-reliance. If we assimilate this lesson, we shall at once free ourselves from disastrous dependence upon foreign countries and ultimate bankruptcy. This is not said in arrogance but as a matter of fact. We are not a small place, dependent for its food supply upon outside help. We are a sub-continent, a nation of nearly 400 millions. We are a country of mighty rivers and a rich variety of agricultural land, with inexhaustible cattle-wealth. That our cattle give much less milk than we need is entirely our own fault. Our cattle-wealth is any day capable of giving us all the milk we need. Our country, if it had not been neglected during the past few centuries, should today not only be providing herself with sufficient food, but also be playing a useful role in supplying the outside world with much-needed foodstuffs of which the late war has unfortunately left practically the whole world in want.

Harijan, 19.10.47

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Centralization of foodstuffs, I apprehend is ruinous. Decentralization easily deals a blow to black-marketing, saves time and money in transport to and fro. Moreover, the villager who grows India's cereals and pulses knows how to save his crops against rodents. The movement of grain from station to station makes it liable to be eaten by rodents. This costs the country many millions and deprives it of tons of grain, every ounce of which we badly need. If every Indian were to realize the necessity of growing food wherever it can be grown, we should most probably forget that there was a scarcity of foodstuffs in the land.

Harijan, 19.10.47

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I have always held that whatever may be said in favour of cash payment of taxes, its introduction injured the nation to the extent that the system of stocking grain in the villages was disturbed.

Harijan, 28.12.47

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But no greater misfortune could perhaps befall the people of India than that their land should be poisoned with artificial fertilizers, the use of which has been condemned by British authorities on agriculture themselves.

We must replace what we take from the soil. The harvesting of crops leads to the impoverishment of the soil which should be replenished by cattle dung and by ploughing in of grasses (see Joseph James' *Must We Starve?* distributed by F. Muller). But chemical fertilizers affect the soil in much the same way as drugs affect the human body. They produce temporary exhilaration, and then there is a relapse. Bumper crops are obtained but they cause new disease and deficiencies in the soil. Balfour in *Living Soil* quotes from a circular letter sent by Sir Albert Howard:

"In the South of France grapes are raised very largely by means of artificials: the many diseases are combated by poison sprays.

"In Baluchistan on the other hand the vine is always manured with farm-yard manure; artificials are not used; the crops have no need for fungicides and insecticides, because diseases are practically non-existent."

British writers hold that crop diseases which are on the increase in England are due to artificials, James quotes from Lord Lymington who says:

"Twenty years ago potatoes were sprayed with copper sulphate mixture once or perhaps twice in a year, but now they are sprayed 12 or 15 times a season. Nearly all this is due to loss of organic manure for land and proper balance of farming" (*Famine in England*).

Chemical sprays affect the crops adversely and shorten considerably the life of the soil itself.

Lord Lymington is of the opinion that artificial manures are highly dangerous:

"The processes of life depend as much on decay as on growth. Healthy growth can only take place when there has been proper decay of organic matter which becomes humus. This can only be brought about by the working of the soil bacteria. Reckless use of sulphate of ammonia, nitro-chalk, potash and other salts kills these bacteria and so the plant cannot remain healthy when there is no humus in the soil."

Animal and human diseases no less than crop diseases are caused by artificials. £6 a year is the amount of money spent in England per head on medicines, and the cost of animal disease is estimated at one-tenth of the farmer's total return from stock.

Foot and mouth disease is prevalent in England and the infected animals are sent to the slaughter house, stock movements being prohibited within a radius of 15 miles from the parts affected by the disease. But Howard testifies that his oxen in India fed on compost-grown food failed to contract the disease, even "rubbing noses" with infected animals.

Balfour quotes from a correspondent who wrote:

"Cabbages . . . grown too fast with nitrate and phosphate are a curious 'wrong' colour. If over 50 per cent of the green stuff given to rabbits is of this sort the rabbits die. If the phosphate goes beyond a certain point the field takes on an unnatural green and is deserted by wild rabbits." Salesmen use this as a recommendation: "Use our soluble phosphate fertilizer and keep the rabbits away", or "Use enough nitro-chalk, and you will get big greens that rabbits will scarcely touch; if they do, they die."

McCarrison, when in charge of the Deficiency Diseases Inquiry in India, found that when wheat was grown on soil treated with farmyard manure, its nutritional value was 17 per cent higher than when grown on soil treated with complete chemical manure. Wheat grown under the latter conditions contained a smaller amount of vitamin A, which is essential in maintaining the resistance of man and his domestic animals to infectious diseases.

McCarrison also found that "if the vitamin B value of cattle manure millet be taken as 1, that of chemical manure millet is approximately .66'.

V.G.Dasai
Harijan, 14.4.46

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The tractor is a machine; the bullock is also a machine, though not so powerful as the tractor. But the bullock is a living machine, and contact with such harmless animals has been a potent factor in the onward march of human civilization. I am not sure that the elimination of animal power and the installation of the lifeless machinery in the Western countries has not something to do with the brutalization of human nature to which frequent and fierce wars bear witness in common with other evils peculiar to the West.

The bullock is not only a living tractor; it is also a living fertilizer factory and gives us farmyard manure which supplies nitrogen and improves the porosity of the soil, thus helping to increase the moisture content of the soil as well as proper aeration. These three factors are essential to plant growth. 'No amount of concentrated manure would help if the porosity of the soil and consequent aeration of the soil are not improved.'

The main agricultural operations of ploughing, harrowing, sowing and interculturing keep the bullocks busy for only three or four months in the year. During the rest of the year they can be and should be used for carrying goods as well as passengers, for crushing oilseeds and so on. The bullocks are capable of doing all this, while the specialized machinery would remain idle during the long dull season.

V.G.Dasai
Harijan, 14.4.46

In the name of increasing the fertility of the soil, much attempt is being made to introduce chemical fertilizers into our agriculture. The experience gained through the use of such chemical fertilizers throughout the world is clear enough to guide us against the inroads to be made by these fertilizers. They do not add to the fertility of the soil, but act as stimulants or drugs resulting in immediate bumper crops and in the end bring about a corresponding exhaustion of the land. They also destroy a host of earth worms so essential for agriculture. In the long run such artificial fertilizers prove to be most injurious to the land. Behind the trumpeting of chemical fertilizers lies the anxiety of the fertilizer factory owners to push the sale of their products irrespective of the harm or injury they do to agriculture.

Besides increasing the bulk of the manures, the fertility of the soil should be maintained by stopping erosion by means of proper drainage, embankments etc. In the final analysis fertility of the soil is the fountain head from which springs all nourishment for cattle and men in the form of fodder and corn. If the fertility of the soil is reduced, the food produce on it will be of poor quality and consequently the health of the people will suffer. This is why nutrition experts connect up health with agriculture.

Harijan, 19.5.46

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One reads of simple indigenous methods of manure-making in China where, from time immemorial they seem to have practised the art. And one hears also that the Chinese peasant gets four times the yield from his soil to what the Indian peasant does. At the same time the villages of China are swept clean, because everything in the way of rubbish is put into the manure pit. Here in India our villages are littered with debris from one year's end to another. All this rubbish can be turned into gold if we will but use it in the right way.

Mirabehn. Harijan, 10.3.46
(See Footnote on P.317)

* * *

It is really a pity that cowdung being the most economic manure, the Indian farmer burns, knowing little that he is burning his own money. But the question arises as to what fuel should he use. Unfortunately, cowdung is the only fuel cheaply available to him. The Government in the past have totally neglected this important problem and seems to have no schemes even at present. Under a National Indian Government which propose to launch a thousand and one schemes for the improvement of Indian agriculture, steps must be taken to really better the lot of the Indian farmer by procuring some other fuel for his use and leave cowdung only for manuring purpose. It may be useful to encourage tree-plantation or coal may be made available wherever possible.

Harijan, 11.5.35, p.103

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The appalling floods in the Mississippi and Ohio valleys, which are likely to cost the United States of America more than 1,000,000,000 Pounds, could have been prevented if there has been an absence of ruthless exploitation of the soil by the use of huge agricultural machinery and an equally ruthless cutting down of forest timber in order to supply the paper mills with wood pulp. Modern civilization has carried out vandalism on such a vast scale that the devastation caused by barbarian armies in the past (from whence the name 'Vandal' was derived) was literally as nothing in comparison. The importance of this great subject is only very gradually becoming recognized. In the long run it carried with it far greater significance than many of the political and social efforts which we place in the foreground of our national programme.

This truth first came home to me, with a misery I can never forget, owing to the floods in the delta of the Mahanadi, which devastated Orissa. Every single inquiry which we made at that time pointed to the deadly harm that had been done, in the upper courses of the river and its tributaries, by denuding the land of its covering of forest trees, which held the excess of water till it sank into the soil. One lesson I learnt by heart, namely, that there would be no true remedy against future floods until the old course of the Mahanadi was conserved by a Conservation Board which would deal with its flow in its upper reaches and not with the delta only.

At Santiniketan, we have anxiously traced the rapid increase of soil erosion drawing near to our own Ashram. The same effects were already being made visible on the daily journey which I took last November between Wardha and Segaoon, across this open country. Evidently, each monsoon is taking its toll of its good soil and washing it away. Surely in India here is a fruitful field of research, waiting for some lover of the soil to explore it thoroughly. One of the very first lessons, and perhaps the greatest of all, will be this that only by a return to simplicity of living and by putting back into the soil those chemical substances which we take out of it for our daily food, can we live in harmony with Nature, and help, instead of hinder, her beneficial works.

C.F. Andrews, Harijan, 27.3.37

Diet

It is ordinarily presumed that an acre of land provides more calories through the production of grains than through any other food. But apart from the question of calories, grains are very poor suppliers of protective food factors. Therefore, if we aim at getting these factors from cereals only, huge quantities of grains will be required. On the other hand, if the grains are substituted and supplemented by foods like fruits and vegetables, nuts, oil-seeds, etc., the protective food factors required to make up a balanced diet may be obtained through lesser quantities of these types of food than through grains alone. Even the supply of calories per acre is greater in the case of some of the root vegetables like potatoes than in the case of cereal grains. Thus a balanced diet may be a double blessing and may offer the solution to our problem. It reduces the per capita requirement of land and at the same time supplies the body with all its requirements in their correct proportions, so as to keep it fit and healthy. It is calculated that the per capita land available in India at present for food cultivation comes to about 0.7 acre. This very land which is found to be too inadequate to meet our requirements in food according to the present distribution of cultivation becomes more than sufficient as only 0.4 acre is the estimated figure required for a balanced diet in the re-ordered system of agriculture. The land of the locality should be so divided for the purpose of growing crops as to provide its population with the materials for a balanced diet rather than merely supplying the cereals for a grain diet as at present. This aspect of the question should be thoroughly investigated and a definite plan chalked out.

Harijan, 19.5.46.

* * *

We eat mill-ground flour, and even the poor villager walks with a head-load of half a maund grain to have it ground in the nearest flour mill. Do you know that in spite of the plenty of foodstuffs we produce we import wheat from outside and we eat the 'superfine' flour from Australia? We will not use our hand-ground flour, and the poor villager also foolishly copies us. We thus turn our wealth into waste, nectar into poison. For whole meal is the proper meal. Mill-ground flour is vitaminless flour, mill-ground flour kept for days is not only vitaminless, but poison. But we will not exert ourselves to produce flour which we must eat fresh every day, and will pay less for nutritious things and purchase ill-health in the bargain. This is not any abstruse economic truth, it is a fact which is daily happening before our eyes. The same is the case with rice and *gur* and oil. We will eat rice, polished of its substance, and eat less nutritious sugar and pay more for it than more nutritious *gur*. We have suffered the village oilman to be driven to extinction and we eat adulterated oils. We idolize the cow, but kill her by slow degrees. We eat honey and kill the honey-bee, with the result that honey is such a rare commodity today that it is only available to a 'Mahatma' like me or to those who must have it from the physician as a vehicle for the drugs he prescribes. If we took the trouble of learning scientific and harmless bee-keeping, we should get it cheaper and our children would get out of it all the carbohydrates they need. In all our dietics we mistake the shadow for the substance, preferring bone-white sugar to rich brown *gur* and pale white bread to rich brown bran-bread.

We are said to be a nation of daily bathers. That we are, to be sure, but we are none the better for it. For we bathe with unclean water, we foul our tanks and rivers with filth and use that water for drinking and bath. We lawyers and degree-holders and doctors will not learn the elementary principles of sanitation and hygiene. We have not yet devised the most economical method of disposal of our evacuations and we turn our open healthy spaces into breeding grounds of disease.

Harijan, 11.5.35. p.103.

Health and Sanitation

The ordinary doctor of *vaidya* is interested mostly in the study of disease. The Nature curist is interested more in the study of health. His real interest begins where that of the ordinary doctor ends; the eradication of the patient's ailment under Nature Cure marks only the beginning of a way of life in which there is no room for illness or disease. Nature Cure is thus a way of life, not a course of 'treatment'. It is not claimed that Nature Cure can cure all disease. No system of medicine can do that or else we should all be immortals.

Harijan, 7.4.46.

* * *

Doctors have almost unhinged us. Sometimes I think that quacks are better than highly qualified doctors. Let us consider: The business of a doctor is to take care of the body, or, properly speaking, not even that. Their business is really to rid the body of diseases that may afflict it. How do these diseases arise? Surely by our negligence or indulgence. I overeat, I have indigestion, I go to a doctor, he gives me medicine. I am cured. I overeat again, I take his pills again. Had I not taken the pills in the first instance, I would have suffered the punishment deserved by me and I would not have overeaten again. The doctor intervened and helped me to indulge myself. My body therefore certainly felt more at ease; but my mind became weakened. A continuance of a course of medicine must, therefore, result in loss of control over the mind.

I have indulged in vice, I contract a disease, a doctor cures me, the odds are that I shall repeat the vice. Had the doctor not intervened, Nature would have done its work, and I would have acquired mastery over myself, would have been freed from vice and would have become happy.

Hospitals are institutions for propagating sin. Men take less care of their bodies and immortality increases. European doctors are the worst of all. For the sake of a mistaken care of the human body, they kill annually thousands of animals. They practise vivisection. No religion sanctions this. All say that it is not necessary to take so many lives for the sake of our bodies.

Though I have had two serious illnesses in my life, I believe that man has little need to drug himself. 999 cases out of a thousand can be brought round by means of a well-regulated diet, water and earth treatment and similar household remedies. He who runs to the doctor, *vaidya* or *hakim* for every little ailment, and swallows all kinds of vegetables and mineral drugs, not only curtails his life, but, by becoming the slave of his body instead of remaining its master, loses self-control, and ceases to be a man.

Autobiography, pp. 329-331.

* * *

I would therefore urge all workers in the social field, whether urban or rural, to treat their medical activity as the least important item of service. It would be better to avoid all mention of such relief. Workers would do well to adopt measures that would prevent disease in their localities. Their stock of medicines should be as small as possible. They should study the bazaar medicines available in their villages, know their reputed properties, and use them as far as possible. They will find as we are finding in Sindi that hot water, sunshine, clean salt and soda with an occasional use of castor oil or quinine answer most purposes. We make it a point to send all serious cases to the Civil Hospital. Patients flock to Mirabehn* and receive lessons in hygiene and prevention of diseases. They do not resent this method of approach instead of simply being given a powder or a mixture.

Harijan, 9.11.35.

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More than three-fourths of these drugs are not only useless but imperceptibly, if not perceptibly, harmful to the bodies into which they are put. Where they do bring some temporary relief to the patients, their substitutes are as a rule to be found in the village bazaar.

Harijan, 5.4.35.

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Nature cure does mean a change for the better in one's outlook on life itself. It means regulations of one's life in accordance with the laws of health. It is not a matter of taking the free medicine from the hospital or for fees. A man who takes free treatment from the hospital accepts charity. The man who accepts nature cure never begs. Self-help enhances self-respect. He takes steps to cure himself by eliminating poisons from the system and takes precautions against falling ill in the future.

Right diet and balanced diet are necessary. Today our villages are as bankrupt as we are ourselves. To produce enough vegetables, fruits and milk in the villages, is an essential part of the nature cure scheme. Time spent on this should not be considered a waste. It is bound to benefit all the villagers and ultimately the whole of India.

Harijan, 2.6.46.

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"The practice of nature cure, does not require high academic qualifications or much erudition. Simplicity is the essence of universality. Nothing that is meant for the benefit of the millions requires much erudition. The latter can be acquired only by the few and therefore can benefit the rich only. But India lives in her seven lakhs of villages — obscure, tiny, out-of-the-way villages, where the population in some cases hardly exceeds a few hundred, very often not even a few score. I would like to go and settle down in some such village. That is real India, my India, for which I live. You cannot take to these humble people the paraphernalia of highly qualified doctors and hospital equipment. In simple natural remedies and *Ramanama** lies their only hope."

Harijan, 7.4.46.

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My nature cure is designed solely for villagers and villages. Therefore, there is no place in it for the microscope, X-rays and similar things. Nor is there room in nature cure for medicines, such as quinine, emetin and penicillin. Personal hygiene and healthy living are of primary importance. And these should suffice. If everyone could achieve perfection in this art, there could be no disease. And, while obeying all the laws of nature in order to cure illness, if it does come, the sovereign remedy ever lies in *Ramanama*.

Harijan, 28.12.47.

Education

The measure of illiteracy is no adequate measure of the prevailing ignorance among the millions of villagers.

Harijan, 31.7.37.

* Mirabehn is the Indian name of an English woman who was one of Gandhi's closest friends.

I hold that true education of the intellect can only come through a proper exercise and training of the bodily organs, e.g. hands, feet, eyes, ears, nose, etc. In other words an intelligent use of the bodily organs in a child provides the best and quickest way of developing his intellect. But unless the development of the mind and body goes hand in hand with a corresponding awakening of the soul, the former alone would prove to be a poor lop-sided affair. By spiritual training I mean education of the heart. A proper and all-round development of the mind, therefore, can take place only when it proceeds *pari passu* with the education of the physical and spiritual faculties of the child. They constitute an indivisible whole. According to this theory, therefore, it would be a gross fallacy to suppose that they can be developed piecemeal or independently of one another.

Harijan, 8.5.37.

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With the best motives in the world, the English tutors could not wholly understand the difference between English and Indian requirements. Our climate does not require the buildings which they need. Nor do our children brought up in predominantly rural environment need the type of education the English children brought up in surroundings predominantly urban need.

When our children are admitted to schools, they need, not slate and pencil and books, but simple village tools which they can handle freely and remuneratively. This means a revolution in educational methods. But nothing short of a revolution can put education within reach of every child of school-going age.

* * *

My plan to impart Primary Education through the medium of village handicrafts like spinning and carding etc. is thus conceived as the spear-head of a silent social revolution fraught with the most far-reaching consequences. It will provide a healthy and moral basis of relationship between the city and the village and thus go a long way toward eradicating some of the worst evils of the present social insecurity and poisoned relationship between the classes. It will check the progressive decay of our villages and lay the foundation of a juster social order in which there is no unnatural division between the 'haves' and 'have-nots' and everybody is assured of a living wage and the right to freedom.

Harijan, 9.10.37.

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Agricultural colleges to be worthy of the name must be self-supporting. I have a painful experience of some agricultural graduates. Their knowledge is superficial. They lack practical experience. But if they had their apprenticeship on farms which are self-sustained and answer the requirements of the country, they would not have to gain experience after getting their degrees and at the expense of the employers.

Harijan, 31.7.37.

Urbanization and Industrialization

I believe that the civilization India has evolved is not to be beaten in the world. Nothing can equal the seeds sown by our ancestors. Rome went, Greece shared the same fate; the might of the Pharaohs was broken; Japan has become westernized; of China nothing can be said; but India is still, somehow or another, sound at the foundation. The people of Europe learn their lessons from the writings of the men of Greece or Rome, which exists no longer in their former glory. In trying to learn from them, the Europeans imagine that they will avoid the mistakes of Greece and Rome. Such is their pitiable condition. In the midst of all this India remains immovable and that is her glory. It is a charge against India that her people are so uncivilized, ignorant and stolid, that it is not possible to induce them to adopt any changes. It is a charge really against our merit. What we have tested and found true on the anvil of experience, we dare not change. Many thrust their advice upon India and she remains steady. This is her beauty; it is the sheet-anchor of our hope.

Hind Swaraj, p.61-2.

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The fact is that we have to make a choice between India of the villages that are as ancient as herself, and India of the cities which are a creation of foreign domination. Today the cities dominate and drain the villages so that they are crumbling to ruin. My *Khadi** mentality tells me that cities must subserve villages when that domination goes. Exploiting of villages is itself organized violence. If we want *Swaraj* to be built on non-violence, we shall have to give the villages their proper place. This we will never do unless we revive village industries by using the products thereof in place of things produced in city factories, foreign or indigenous. Perhaps, it is now clear why I identify *Khadi* with non-violence. *Khadi* is the chief village handicraft. Kill *Khadi* and you must kill the villages and with them non-violence. I cannot prove this by statistics. The proof is before our eyes.

Harijan, 20.1.40.

* *Khadi*: Handspun and handwoven cloth.

I am convinced that if India is to attain true freedom and through India the world also, then sooner or later the fact must be recognized that people will have to live in villages, not in towns, in huts, not in palaces. Crores* of people will never be able to live at peace with each other in towns and palaces. They will then have no recourse but to resort to both violence and untruth.

I hold that without truth and non-violence there can be nothing but destruction for humanity. We can realize truth and non-violence only in the simplicity of village life and this simplicity can best be found in the *Charkha* and all that the *Charkha* connotes. I must not fear if the world today is going the wrong way. It may be that India too will go that way and like the proverbial moth burn itself eventually in the flame round which it dances more and more fiercely. But it is my bounden duty up to my last breath to try to protect India and through India the entire world from such a doom.

The essence of what I have said is that man should rest content with what are his real needs and become self-sufficient. If he does not have this control he cannot save himself. After all, the world is made up of individuals just as it is the drops that constitute the ocean This is a well-known truth

There are two schools of thought current in the world. One wants to divide the world into cities and the other into villages. The village civilization and the city civilization are totally different things. One depended on machinery and industrialization, the other rested on handicraft. We have given preference to the latter.

It is the city man who is responsible for war all over the world, never the villager.

Gleanings, (1949), p.17.

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Civilization, in the real sense of the term, consists not in the multiplication, but in the deliberate and voluntary reduction of wants. This alone promotes real happiness and contentment, and increases the capacity for service.

From Yeravda Mandir (1935), Chap. 6.

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You cannot build non-violence on a factory civilization, but it can be built on self-contained villages. Even if Hitler was so minded, he could not devastate seven hundred thousand non-violent villages.

Harijan, 4.11.39. p.337.

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Rome, Greece, Babylon, Egypt and many others are a standing testimony in proof of the fact that nations have perished before now because of their misdeeds. What may be hoped for is that Europe on account of her fine and scientific intellect will realize the obvious and retrace her steps, and from the demoralizing industrialism she will find a way out. It will not necessarily be a return to the old absolute simplicity. But it will have to be a reorganization in which village life will predominate, and in which brute and material force will be subordinated to the spiritual force.

Young India, 6.8.25. p. 273.

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To make India like England and America is to find some other races and places of the earth for exploitation. So far it appears that the Western nations have divided all the known races outside Europe for exploitation and that there are no new worlds to discover. What can be the fate of India trying to ape the West? Indeed the West has had a surfeit of industrialism and exploitation. If they who are suffering from the disease are unable to find a remedy to correct evils, how shall we, mere novices, be able to avoid them?

Young India, 7.10.26. p.348.

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The critics say that water, air, oil and electricity should be fully utilized as they are being utilized in the go-ahead West. They say that control over these hidden powers of Nature enables every American to have thirty-three slaves.

Repeat the process in India and I dare say that it will thirty-three times enslave every inhabitant of this land, instead of giving everyone thirty-three slaves.

Harijan, 16.11.37.

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Pandit Nehru wants industrialization, because he thinks that if it is socialized, it would be free from the evils of capitalism. My own view is that the evils are inherent in industrialism, and no amount of socialization can eradicate them.

Harijan, 29.9.40. p.299.

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* Crores: Tens of thousands.

As I look at Russia where the apotheosis of industrialization has been reached, the life there does not appeal to me. To use the language of the Bible, "What shall it avail a man if he gain the whole world and lose his soul?" In modern terms, it is beneath human dignity to lose one's individuality and become a mere cog in the machine. I want every individual to become a full-blooded, fully developed member of society. The villages must become self-sufficient. I see no other solution if one has to work in terms of Ahimsa. Now I have that conviction.

Harijan, 28.1.39. p.438.

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A factory employs a few hundred and renders thousands unemployed. I may produce tons of oil from an oil mill, but I also drive thousands of oilmen out of employment. I call this destructive energy, whereas production by the labour of millions of hands is constructive and conducive to the common good. Mass production through power-driven machinery, even when State-owned, will be of no avail.

But why not, it is asked, save the labour of millions, and give them more leisure for intellectual pursuits? Leisure is good and necessary up to a point only. God created man to eat his bread in the sweat of his brow, and I dread the prospect of our being able to produce all that we want, including our foodstuffs, out of a conjurer's hat.

Harijan, 16.5.36. p.111.

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America is today able to hold the world in fee by selling all kinds of trinkets, or by selling her unrivalled skill, which she has a right to do. She has reached the acme of mass production, and yet she has not been able to abolish unemployment or want. There are still thousands, perhaps millions of people in America who live in misery, in spite of the phenomenal riches of the few. The whole of the American nation is not benefited by this mass production.

Are there not over three millions unemployed in England today? A question was put to me only the other day: 'What are we doing with these three million unemployed?' They cannot shift from factory to field in a day. It is a tremendous problem.

*Mass Production is Production by the Masses by Pyarelal.**

* * *

A time is coming when those, who are in the mad rush today of multiplying their wants, vainly thinking that they add to the real substance, real knowledge of the world, will retrace their steps and say: 'What have we done?' Civilizations have come and gone, and in spite of all our vaunted progress I am tempted to ask again and again 'To what purpose?' Wallace, a contemporary of Darwin, has said the same thing. Fifty years of brilliant inventions and discoveries, he has said, has not added one inch to the moral height of mankind. So said a dreamer and visionary if you will — Tolstoy. So said Jesus, and Buddha, and Muhammad, whose religion is being denied and falsified in my own country today.

Young India, 8.12.27. p.414.

Religion

The ultimate definition of religion may be said to be obedience to the law of God. God and His law are synonymous terms. Therefore God signifies an unchanging and living law.

Harijan, 25.8.40.

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I have found that life persists in the midst of destruction and, therefore, there must be a higher law than that of destruction. Only under that law would a well-ordered society be intelligible and life worth living. And if that is the law of life, we have to work it out in daily life.

I do dimly perceive that whilst everything around me is ever changing, ever dying, there is underlying all that change a living power that is changeless, that holds all together, that creates, dissolves and re-creates. That informing power or spirit is God. And since nothing else I see merely through the senses can or will persist, He alone is.

And is this power benevolent or malevolent? I see it is purely benevolent. For I can see that in the midst of death life persists, in the midst of untruth truth persists, in the midst of darkness light persists. Hence I gather that God is life, Truth, Light. He is Love. He is the Supreme God.

Young India, 11.10.28.

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*F.N. Pyarelal: Secretary to Mahatma Gandhi.

I know how in the name of truth and science inhuman cruelties are perpetrated on animals when men perform vivisection. There are thus a number of difficulties in the way, no matter how you describe God. But the human mind is a limited thing, and you have to labour under limitations when you think of a being or entity who is beyond the power of man to grasp.

And then we have another thing in Hindu philosophy, viz. God alone is and nothing else exists, and the same truth you find emphasized and exemplified in the Kalma of Islam. There you find it clearly stated — that God alone is and nothing else exists. In fact the Sanskrit word for Truth is a word which literally means that which exists — Sat. For this and several other reasons that I can give you I have come to the conclusion that the definition, 'Truth is God', gives me the greatest satisfaction. And when you want to find Truth as God the only inevitable means is Love, i.e. non-violence, and since I believe that ultimately the means and end are convertible terms, I should not hesitate to say that God is Love.

Young India, 31.2.31.

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I share the belief with the whole world — civilized and uncivilized — that calamities (such as the Bihar earthquake of 1934) come to mankind as a chastisement for their sins. When that conviction comes from the heart, people pray, repent and purify themselves . . . I have but a limited knowledge of His purpose. Such calamities are not a mere caprice of the Deity or Nature. They obey fixed laws as surely as the planets move in obedience to laws governing their movements. Only we do not know the laws governing these events and, therefore, call them calamities or disturbances.

Harijan, 2.2.34.

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To see the universal and all-pervading spirit of Truth face to face one must be able to love the meanest of creation as oneself. And a man who aspires after that cannot afford to keep out of any field of life. That is why my devotion to Truth has drawn me into the field of politics; and I can say without the slightest hesitation, and yet in all humility, that those who say that religion has nothing to do with politics do not know what religion means.

Autobiography, 1948; p.615.



"We all belong to the same human family, let us work in love."

Kaka Kalelkar, 4.2.75.

Kaka Kalelkar is now 19 years old. He was one of Gandhi's closest friends and when Gandhi was sent to prison for sedition in 1922, edited his newspaper *Navajivan* for which he also served a jail sentence.

Until he met Gandhi Kalelkar was himself a revolutionary dedicated to fighting to get the British out of India.

When he was asked why he had forsaken the army he replied: 'Gandhiji was the better General.'



These excerpts were taken from the following books by M. K. Gandhi.

Basic Education
Rebuilding Our Villages
Industrialize — and Perish
Food Shortage and Agriculture
Nature Cure
Darvodaya
Truth is God
India of My Dreams
Village Swaraj and Co-operation

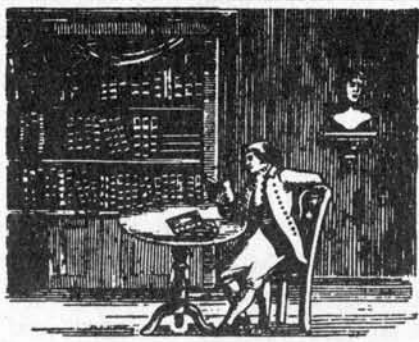
Published by Navajivan Publishing House and distributed in this country by Housman's Bookshop Ltd., 5 Caledonian Road, King's Cross, London N1 9DX.

also:

The Science of Satyagraha
The Gospel of Swadeshi
Published by Bharatiya Vidya Bhavan

Editor's Note

The key concepts of *Bhoodan* and *Gramdam* which were developed by Jayaprakash Narayan (J.P.) and Vinoba Bhave will be the subject of future articles in *The Ecologist*.



Books

THE ECOLOGICAL SITUATION IN TAMIL NADU AND THE NEED FOR AMELIORATION

Report published by the State Planning Commission. Madras. 1973.

This very high quality report was presented to the State Planning Commission in Madras in December, 1973 by the working group on Ecological Balances.

Its Chairman, Dr. V. Shanmugasundram is actually a member of the Planning Commission — which suggests that it might influence public policy in Tamil Nadu — as indeed it should. The rapporteur was Professor B. M. Thirunaranan and the secretary Thiru D. Natarajan.

The report shows that, as in most of India, ecological deterioration has contributed a great deal to the poverty of the people of Tamil Nadu. "The yields of almost all crops in India are among the lowest in the world. Continuous cultivation for centuries, without either manuring or crop rotation, has brought the soils to the verge of exhaustion. Studies of crop yields in some parts of North India have shown that yields have gone down further during the last few decades."

In Tamil Nadu very serious soil erosion has occurred and is largely the result of over-grazing and felling trees for firewood — what is more the damage done is, on an historic timescale, largely irreversible. Thus: "Around most of our villages", we read, "the poramboke lands are almost barren due to overgrazing and trampling by the village cattle; the continuous lopping and fuel collection by the villagers, effectively removes the few surviving shrubs and bushes. On sloping ground, overgrazing and indiscriminate re-

moval of the trees and shrubs completely exposes the soil, which erodes rapidly, leaving almost barren, boulder-covered hill masses that are so conspicuous everywhere in the landscape of Tamil Nadu. The damage thus caused is quite serious because the good red soils and dense forest cover were developed under the more rainy conditions that prevailed during Pleistocene times, and are unlikely to be restored, under the drier conditions now prevailing. These rocky ridges represent the final stage to which the land has been reduced by destructive natural agencies let loose by thoughtless human actions."

Much of this area was once covered with dense forests which have been systematically destroyed and deprived of their protective forest cover. "...the hillsides were bared to the full force of the monsoons, and it did not take long for the soil to be eroded and carried into the rivers, making their channels unnavigable and choking their mouths. Many of the small harbours near the mouths of the rivers of Peninsular India, have silted up during the last hundred years."

These trends must inevitably affect groundwater conditions. Indeed the report confirms that these "have been worsening, in all districts in Tamil Nadu, but happily this has lately aroused a measure of public concern, and certain useful steps have been taken. A part of this deterioration is undoubtedly due to the decrease in percolation of rainwater and recharging of the water-table which have followed the removal of the natural plant cover and the soil mantle of the upland tracts."

The problem has been aggravated by the planting of "economically desirable" exotics such as eucalyptus, to replace indigenous forests. When this occurs, the composition and extent of the undergrowth will change, and likewise the plant litter, which will in due course change into humus and get absorbed into the soil. These changes will also modify the fauna, and especially the small creatures and micro-organisms that dwell in the soil. All these changes will certainly influence the extent of percolation and the capacity of the soil to retain and hold moisture.

The wildlife of Tamil Nadu is "fast approaching extinction". It has suffered from habitat encroachment, pesticides and poaching — which has worsened with the availability of firearms since the last war. "The cheetah has been wiped out of existence from the whole of India. The tiger, the panther, the four-horned antelope, the Nilgiri langur, the lion-tailed macaque, the sloth bear, the sambhur, the gaur (bison), the tahr (Nilgiri ibex) have all become extremely rare."

Even the spotted deer, the black buck, and the elephant have been greatly reduced in numbers, and the introduction of exotic species like eucalyptus and wattle tends to produce habitats unsuitable for our wildlife. "When grazing inside forest areas is permitted, the villagers become directly interested in killing the wild animals which may prey on their herds. Pesticides like folidol and endrin are often used to poison the wild animals. Infectious diseases like rinderpest have also spread from the domestic herds to the forest animals like the bison and decimated their numbers."

The growth of towns has also had its impact. "Around most towns" we read, "and more especially around the larger urban centres, where the land tends to become more valuable, extensive areas are made unusable by dumping urban and industrial waste, or by quarrying and digging stone, earth and gravel for building and road making. These areas tend to become ill-drained and insanitary, the water accumulating in the depressions facilitates the breeding of mosquitoes and flies. Thus even a rapid review of the ecological situation shows that there is urgent need for remedial measures."

Why is nothing done? The tragedy is that "there is very little active interest or concern — for that matter, there is very little awareness of the position — among the leaders of public opinion, or even among the intellectual elite of the population. The inadequacy of our education at all levels leaves us incapable of appreciating the significance of what we see in our surroundings. Soil conservation is now accepted as desirable, but water conservation, and conservation of

areas to preserve plant species to ensure their survival and future availability, are hardly even mentioned in discussions and deliberations on our environmental problems. There is urgent need to arouse public awareness and public interest in the environmental damage going on all around."

It is essential, as the report points out, that people should realise that: *"Man's activities constitute a perpetual source of disturbance of the environment, which would otherwise tend to reach a natural state of equilibrium. Modern technology and present-day human organisation enable men to interfere with the physical environment on a vastly larger scale than in the past, and there is therefore, great danger of causing immense harm by the misuse of these means. Actions taken without due consideration of the inherent dangers may start a series of irreversible changes or trends in the environment, culminating in a serious or even permanent impairment of its productive potential. It is one of the main purposes of this note to draw attention to this danger."*

A very thorough programme of re-afforestation and in general of soil and water conservation is proposed allied to a massive re-education programme. It is to be hoped that this important report is being widely read in official circles.

Edward Goldsmith.

He is no apt pupil who will not build upon the foundations laid by his teacher for him. He only deserves a good teacher who would add to the legacy that the teacher has left him. I should be an unworthy son to my father if I should not add to my inheritance, and so I have always regarded it as a matter of pride that, thanks be to God, what I have learnt from Tolstoy has fructified a hundred-fold.

Mahatma Gandhi

ETHIOPIA MARX TIME

in every part of the inhabited world
banners are proudly flying because
their bearers have found the Answer

now the Ethiopians know
famine is caused by bad landlords
the land is plentiful and there will always be
harvest after harvest
we only starve (they say) because
the Wicked conspire against Us

and still the desert drifts quietly south
to bury conspirators and banners
under the same heap of dust

but the bannerbearers are never daunted
they bravely execute the landlords
knowing that They are responsible
for everything (including the weather)

Colin Fry

Should Britain feed itself?

Conference organised by the Conservation Society and
United Kingdom and Ireland Agricultural Students Association
at the PALMER BUILDING, READING UNIVERSITY
on Saturday 22 November 1975.

Professor Kenneth Mellanby, author of 'Can Britain Feed Itself?'
Christopher Ritson, Department of Agricultural Economics,
Reading University.

J H Cossins, Vice President of National Farmers' Union
Professor Sir Joseph Hutchinson

Chairman: Dr. JOHN LORAIN, Vice Chairman, Conservation Society

There is no doubt that Britain COULD feed itself and this would be easy, given a sufficiently drastic change of diet. This conference will look at the question 'To what extent should Britain feed itself?' and discuss the range of options and their implications.

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5 couples wanting to buy a small country estate to set up a commune need 2 more couples. Most of us are lecturers or teachers. Interests: wanting to live together as a larger social unit, women's lib., alternative technology, some degree of self-sufficiency, political involvement and alternative education. Capital or earning power required. Box No. PD.91.

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