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'One in every five children born in the Third World will not live to reach the age of five. In the majority of cases death is directly or indirectly due to malnutrition.'

The author, Stanley Barnes, quotes a United Nations' report that at least 200 million children suffer malnutrition. Of these, 10 million are likely to die and 90 million could not withstand a serious illness. Many that live will be robbed by lack of protein of the chance of normal mental and physical development.

He declares: 'The fact that we tolerate such an appalling wastage of human life in a world where there is enough food to meet the basic needs of every person cannot be justified.'

As a dairy expert he says a perfect food for infants, particularly for meeting protein needs, is milk. Yet in Europe alone some 2 million tonnes of skim milk powder is fed to animals when it would be enough to provide every one of those 200 million children with a glass of protein-rich milk every day.

Stanley Barnes also surveys the extent of poverty in the Third World and employment prospects; world food needs; aid and international trade. He stresses the need for long-term integrated schemes to aid developing countries rather than *ad hoc* measures.

This is a 'first class compendium of information on the strategy for ending hunger.' A book for the layman and expert.

200 Million Hungry Children

by

Stanley Barnes

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Units and Measures Used

In all cases currency has been expressed in US dollars. Conversion rates used are:

1 US dollar	8 Indian rupees or 0.5 pounds sterling or 0.88 Australian dollars
1 kilogram	2.205 pounds
1 tonne	2205 pounds or 1000 kilograms
1 imperial gallon	4.546 litres
1 US gallon	0.833 imperial gallons
1 inch	2.540 centimetres
1 yard	0.914 metres
1 kilometre	0.6214 miles
1 hectare	2.471 acres
1 acre foot of water	325,829 US gallons or 271,415 imperial gallons

Dedicated to the memory of my wife Joyce,
who cared deeply for all children,
especially the poor little boys and girls who gathered
round the gate of our home in Bogor, Indonesia,
and whom she made her friends.

CONTENTS

There is no finer investment for any community than putting milk into children.

Winston Churchill

FOREWORD

There have been a good many books written on the food needs of a desperate world and on the plight of children, but few of them could have been written from greater practical experience than this one.

Mr Barnes is an Australian dairy expert — originally English — with experience in Britain, Malta, Australia and in Asia. In Indonesia, Singapore and Thailand he has carried through major dairy projects.

Milk is a first class protein which encounters no religious opposition as an item of diet from any quarter, and is crucially important to children, but Mr Barnes does not confine to that commodity his vision of world co-operation to end the disaster of starvation.

In 1953 I was a delegate from the Australian Parliament to the Coronation of Queen Elizabeth II. While I was in London I was invited by the head of the Food and Agricultural Organisation of the United Nations (FAO) at that time, the late Lord Boyd-Orr, to have lunch with him at Parliament.

I had never met him in my life and the invitation was a surprise. He had on his staff a fellow Australian who had been in my class in my school days at Perth Modern School, and that fact in part explains the invitation.

But the real explanation came in a challenging question he put to me:

'Beazley,' he said, 'When is it that Australians, and above all West Australians, are going to realise that you have solved many of the problems of arid farming? In the arid areas of the world my best officers are Australians and the best research has been done by them. People from fertile countries have not the years of experience of dry farming.'

Two countries using their oil wealth, Libya and now Iraq, have purchased whole Western Australian agricultural systems

and the services of personnel, with notable results in the case of Libya which have led to the action by Iraq.

Stan Barnes' book is a plea for precisely that kind of pooling of skill which Lord Boyd-Orr referred to in the case of arid agriculture, and regardless of the capacity of the recipient of expertly directed assistance to pay. The moral claims of hunger are imperative. There can be no valid political objections, even in the debased realm of power politics, to ensuring the dignity and well-being of children.

Dr Paul Campbell, in a recent address, pointed out Christ's commitment on this question:

'In one of His talks Christ draws the picture of mankind standing before the Great Judge. They are being sorted out. To His right go those who came to His help when He was needy, hungry, homeless, sick and lonely. To the left and into oblivion go those who withheld their aid. When they ask, "When were You hungry, in prison, homeless and we failed to help You?" He replies, "Your failure to do it for the least of these My brothers means you failed to do it for Me." '

This book is a plea to face the facts; a plea to deploy the will to meet very great needs; a plea for creating the dignity of self-reliance; and it is first-class thinking and a first-class compendium of information on the strategy of ending hunger.

It is far-reaching statesmanship, planning for generations. It speaks truth to affluence, and to corruption which impedes the statesmanship of the ordinary man. Information and a sharpening of the conscience and a heightening of sensitivity are needed to end starvation.

The book conveys information, enlightens the conscience and is extremely practical.

DR KIM E. BEAZLEY, AO, FACE,
Australian Minister for Education, 1972-75

PREFACE

During the International Year of the Child, governments took steps to make people more aware of the rights and needs of children, and to enlist support for action in their interest. But plans can have little meaning unless we ensure that basic food needs of all children are met. Today, in the Third World, malnutrition brings suffering and death to many millions of children and condemns many of those that survive to a life of limited mental and physical development.

We live in a world where Western nations do their best to restrict milk production and to dispose of surplus milk powder to animals at highly subsidised prices, although milk is the best form of protein and the most readily available means of answering malnutrition in children. It seems totally wrong that human life can be considered of so little value in the 20th century. It was this situation that prompted me to write this book.

Since 1962 I have lived mainly in Asia as a project manager in the dairy and food industry and as an industrial consultant. Following my retirement six years ago, I have been living in India.

As a foreigner living in a Third World country I have had to come to terms with poverty and hunger knowing that there is no simple solution. One comes to admire the cheerful and philosophical way in which poor people live with the intolerable. Yet occasionally the sheer hopelessness of the situation breaks through one's reserve and leaves a memory that time does not easily wipe out.

When visiting Australia or Europe I am frequently asked, 'What can we do to help answer malnutrition?' or 'If we go without one meal a week will it make more food available in the poor countries?'

This book is an attempt to answer some of these questions. I

have written with the 'man in the street' in mind without too many tedious graphs or too much international aid jargon. The first part of the book is devoted to a brief explanation of poverty, malnutrition, world food supplies, aid and other matters concerning the Third World. I give two examples of outstanding achievements in India which give hope for the future. Finally, because I am convinced that answering malnutrition, especially among children, is the most urgent need, I have suggested ways in which milk can be used now to achieve this end.

Poverty and malnutrition are so widespread in the Third World that any answer must depend on government to government action and on the international agencies. People who understand the situation can insist that governments take effective action to use available resources in answering malnutrition. While I write mainly for the 'haves', it will take the combined resources of the developed and the developing countries to banish poverty. People with compassion in the rich and in the poor nations, who are really concerned, must demand that the needs of children come before economic considerations.

We in the West have so much while the people of the poor countries struggle to exist with so little. If this book can help to awaken people to the need for action it will have served its purpose.

STANLEY BARNES

India, June 1979

INTRODUCTION

Although born in London I always loved the country and, at the age of fifteen, left school and for the next two years worked on a farm in the Welsh mountains. When seventeen I entered the University College of Wales at Aberystwyth to study agriculture and dairying. Leaving college and urgently in need of earning some money, I accepted the first job offered which happened to be that of a rounds foreman in a retail milk business in London. So I entered the dairy industry and am grateful for the chance offer which resulted in an interesting and satisfying working life.

The initial job only lasted six months but it proved a stepping stone to the management of a cheese factory in South Wales. Three years later the same company bought a disused milk factory in the lovely Cotswold village of Moreton-in-Marsh, where the old buildings were pulled down and a new milk processing factory erected. This gave me my first experience in supervising a new project.

In 1935 I left Moreton-in-Marsh to go to Malta as first manager of a goats' milk pasteurisation scheme to be established by the colonial government on this Mediterranean island.

The Island of Malta, 260 square kilometres in area, had a population of 350,000 people and 50,000 goats. Goats roamed the streets from early morning until late at night to be ready at all times to make a direct delivery of milk into a householder's jug. Milking the goat on the doorstep in front of the customer ensured that the milk was fresh and was also a reasonable precaution against added water. Although I did hear of one milkman caught with a bottle of water up his sleeve and a rubber tube leading into the customer's milk jug.

The problem was that the goats' milk carried the bacteria *Brucella melitensis,* which caused undulant fever or Malta

fever as it was known to the foreigners. This extremely virulent and harmful disease resulted in much illness and occasional deaths among the Maltese people.

In 1908 the bacteria causing the disease were identified and traced to the goats' milk. It is not surprising that the disease had been so widespread as, up to the time of this discovery, the treatment for undulant fever was a diet of goats' milk. British military and naval personnel used to suffer greatly from the disease, but from 1908 were forbidden to drink goat's milk; all foreigners were warned to take the same precaution.

Undulant fever continued to undermine seriously the health of the Maltese who disliked boiling the milk before use. In the '20s a representative committee appointed by the Governor recommended the introduction of a scheme for the pasteurisation of all goats' milk and for the prohibition of the sale of raw milk. However the idea of compulsory pasteurisation was still relatively new and the government of the day hesitated to enforce such a radical change in an established local custom.

Finally the colonial government, concerned at the widespread incidence of undulant fever, decided to implement the proposals of the committee. This led to my appointment to draw up and manage a milk treatment and distribution scheme to replace the roaming goats.

Nothing was known in the Island of modern milk treatment and marketing, but I was given every co-operation by the administration, especially the Health Department, although I frequently faced a hostile press. At the time, the Maltese leadership was agitating for a resumption of self-government. So it was not surprising that any apparent weakness or delay in a project introduced by the colonial administration was highlighted and used as an argument in favour of government by an elected parliament.

Before the milk scheme came into operation the government agreed to my request for two experienced assistants and a quality control officer from overseas.

Goats were kept in rooms adjoining the homes of the owners except in Valetta where goat keeping was forbidden. Some

5,000 goats were driven into the city each day for milking. Goats in the narrow streets from early morning until late at night added considerably to the hazards of driving as well as to the smells.

Three milking depots were built in the country to which the goats could be driven for milking under supervision. To avoid congestion each goat owner was allotted a time at which to bring his goats to the depot; a system made easier by the fact that the goats were brought for milking once a day. The milking depots included a large covered concrete yard, 10,000 goats being milked daily in the largest depot.

At the milk treatment centre, built in Hamrun, the milk was pasteurised, then cooled and filled into glass bottles on the modern bottle filling machine. Careful laboratory control ensured that all milk was properly pasteurised and the dangerous undulant fever bacteria completely destroyed. For distribution 20 insulated electrical delivery vans were imported from Britain.

In 1938 the Governor of Malta, Sir Charles Bonham-Carter, declared the Milk Centre open and launched the scheme. Pasteurised milk had been prepared for the occasion but those present approached this long forbidden drink with some trepidation. The Governor gave the lead when, with at least the appearance of complete confidence, he stepped forward and tossed down a glass of pasteurised goats' milk.

A special ordinance gave the government powers to declare any area a prohibited place for goats and raw goats' milk, the first place to be cleared being the city of Valetta. In the months that followed the adjoining residential areas of Floriana, Sliema and St Julians were also cleared of goats and raw milk. As each area was cleared the incidence of undulant fever fell rapidly.

In 1940, with the entry of Italy into the second world war on the side of Germany, Malta came under attack and no further extension of the milk scheme was possible. I handed over management to a local man and was commissioned in the Royal Air Force where I became Command Fuel Officer; at least I was still responsible for a liquid. During the war and the

siege of Malta the goat population was very much reduced as goats' meat was at times the only meat available. With the ending of the war the milk scheme was once again extended and cows were introduced to replace most of the goats for the supply of milk.

I visited Malta in 1965 with my wife and found that pasteurised milk was on sale in all parts of Malta and the adjoining island of Gozo; undulant fever was almost a thing of the past. At the time of my most recent visit, in 1975, the milk scheme had become an important government health measure and milk was being made available to all people, including children, at a subsidised price.

While in Malta I had met and married Joyce, who was the Assistant Matron of King George V Hospital. Later on our son Peter was born in this hospital midst the crash of bombs and the roar of the Grand Harbour guns. Perhaps little wonder that to me Malta will always remain a second home.

After the war I joined Bengers Limited to manage a new factory being built in Northern Ireland. The company already had one factory in operation on the same site, so while the new buildings were being completed I was able to gain experience in the spray drying of pharmaceutical products in this factory. Before the new factory was finished I accepted an offer from the company to go to Australia, to be responsible for setting up a new factory for the manufacture of Bengers Food and other products. We arrived in Australia in 1947 but, nine months later, the Australian venture was abandoned. After winding up the project, we moved to Queensland and, for the next eight years, I was Project Manager for a rapidly expanding dairy company in Brisbane.

During this time I became increasingly interested in dairy development in Asia, particularly to help meet the needs of children. So in 1957 I accepted a one year appointment as Dairy Development Adviser to the Government of Pakistan. In this capacity I was to be responsible to the Food and Agricultural Organisation of the United Nations (FAO) for preparing detailed proposals for dairy development in Karachi and Lahore.

When India won independence in 1947 the new nation of Pakistan was created with Karachi as the capital. The population of this city increased almost overnight to two million as Muslims swarmed across the border from India. There was a corresponding increase in the cattle population and, by 1957, it was estimated that from 40,000 to 50,000 animals, mostly milking buffaloes, were being kept in the city. 180,000 litres of milk a day was being produced by these animals and a further 70,000 litres was being brought into the city each day from the surrounding districts. The concern of the government was to reduce the cattle population in the city and at the same time increase the quantity of milk available. Hence help was sought from the Food and Agricultural Organisation to prepare a suitable scheme.

Cattle in Karachi were kept in open sheds or open earth yards with no drainage. The marketing of milk was completely unorganised and adulteration with water from the nearest supply was widespread. But for the universal custom of boiling all milk in the home before use, the milk supply of Karachi would have constituted a major health hazard.

Typical of Karachi's milk supply at that time was 'Abdulla's Dairy Farm'; this title being proudly displayed on an impressive arch over the entrance. Inside, in an open earth yard, some 300 buffaloes were tied to stakes. There was no drainage and no attempt at sanitation or cleanliness. One foreign lady assured me that she had a good milk supply because it came from 'Abdulla's Dairy Farm'. I suggested that she visit the 'dairy farm'.

Karachi lies between the Sind desert and the sea in an area of low rainfall, a region that has nothing to commend it for milk production. Some cattle were kept in the Sind desert in places where water from the river Indus was available for irrigation. The best short term plan seemed to be to expand these cattle colonies to accommodate cattle from the city.

The ancient city of Lahore, located in the rich agricultural region of the Punjab, is noted for its milk products, especially butter and ghee. In 1957 the city had a population of nearly one million while 6,000 cattle were being kept in and around

the old walled city. 27,000 litres of milk was being produced by these cattle daily and a further 95,000 litres was being brought into Lahore from the surrounding districts.

One morning while driving in the country with the local dairy officer we came across a brick building described as a separating centre. Farmers were arriving on bicycles with brass pots of milk on their carriers. Most of these pots had a wedge of grass stuffed in the top to prevent the milk from splashing out. In a room black with flies milk was being separated with an old hand separator. The procedure seemed to be for the farmers to have part of their milk separated, sell the cream to the man who ran the centre and return the skim milk to the pot. They then proceeded to make up the difference with water and carry on to Lahore to sell the contents. Perhaps with some reason the price of milk in Lahore was only 8 annas (US$ 0.10) a litre compared with 11 to 15 annas (US$ 0.14 to US$ 0.20) a litre paid for milk in Karachi.

During my first visit to Lahore a Danish adviser and myself were taken on a tour of the military dairy farm by the Brigadier in charge of army milk production units in Pakistan. This efficiently run and well organised farm had over 1,000 buffaloes housed in spacious sheds; adequate supplies of green fodder being grown on the farm. The Brigadier had imported a few Jersey cows and bulls for experimental crossing with the local Red Sindhi cows. He had a couple of crossbred calves brought out for us to see and they certainly looked very much like purebred Jerseys. We were offered a glass of fresh Jersey milk, straight from the cow, as a special treat. Needless to say we were not as enthusiastic as the Brigadier about unboiled milk, having doubts regarding the cleanliness of the hands that had done the milking. To refuse would have been the height of rudeness to our host who had been very kind. So we cheerfully showed our appreciation of the milk, my Danish colleague even having a second glass. That night we succumbed to the expected attack of dysentery but it was worth it.

An earlier survey by the FAO had recommended milk treatment plants for both Karachi and Lahore, including equipment for making recombined milk (see chapter 13) from

imported milk powder and butter oil to augment the local milk supply. This would help to make milk available for malnourished children. Also experience in India had been that cattle owners strongly objected to their cattle being moved into the country, so had created an artificial milk shortage in order to gain public sympathy against the move. By increasing the quantity of milk available this tactic could be thwarted.

Before taking up the appointment in Pakistan I had visited the FAO in Rome and the United Nations Children's Fund (UNICEF) in Paris for discussions. This agency had made attempts to improve child nutrition through a supplementary feeding programme using skim milk powder provided free by the USA under aid programmes. The milk powder had been distributed to the schools to be mixed with water and drunk by the children at school under supervision. Lack of proper facilities for mixing powder, poor water supplies and overcrowded and under-staffed schools made implementation difficult. Many overworked teachers simply gave the powder to the children to take home resulting in much of it finding its way on to the black market. Finally the scheme had to be abandoned.

Towards the end of the year the milk powder exporting countries in the West appointed a six man team of experts to visit Pakistan and consider the detailed proposals which had been prepared for dairy factories in Karachi and Lahore. Following consultation with officers of the Pakistan government, they recommended acceptance of these proposals for both cities. Regrettably, in spite of the urgent need to improve the milk supply and deal with malnutrition in the children, the milk powder exporting countries were not prepared to finance these two projects.

Some years later these proposals formed the basis of a scheme for Karachi, implemented with the help of finance from UNICEF.

After four years back in Australia an opportunity came to return to Asia as Project Manager for the Australian Dairy Produce Board, to take charge of a new dairy project in Thailand. A joint venture company was set up in which the

capital was held by Thai interests and the Australian Dairy Board, who were responsible for providing the processing plant, and for managing the project in the initial stages.

South East Asia is an extensive market for sweetened condensed milk, the main form in which milk is used in that region. For many years these countries had been supplied with condensed milk almost entirely from Europe. With the development of new processes for recombining skim milk powder and butter oil it was no longer necessary to import the finished product. Importing milk powder and butter oil and manufacturing condensed milk locally resulted in a saving of 50 per cent in foreign exchange and a new industry and opportunities for employment; this type of development is known as import substitution. In the case of sweetened condensed milk, which contains over 40 per cent of cane sugar, using a locally grown product was an added advantage to a sugar exporting country like Thailand.

Unfortunately the Government of Thailand did not make the development of local milk production a condition of granting a licence for this project. In this way they lost the opportunity of ensuring that a market would be provided for local milk, leaving the industry permanently dependent on imports. This question will be discussed fully in a later chapter.

There is an almost complete absence of cows or buffaloes kept for milk production in South East Asia although the adjoining Indian sub-continent has over 20 per cent of the world's cattle. So sweetened condensed milk, which will keep for some days without refrigeration after the can has been opened, became the traditional form of milk for the countries of South East Asia and is used by them in large quantities.

In Thailand the biggest customers are the coffee shops where the usual drink is a glass of tea or coffee with a spoonful of condensed milk. In the absence of other forms of milk, sweetened condensed milk is used for feeding babies, but because of the high sugar content, needs to be used with the right proportion of water. For this reason Health Authorities in many countries require sweetened condensed milk to be labelled 'Unfit for Infants'.

The Australian Dairy Produce Board, aware of the extent of the South East Asia market, decided to set up factories for the manufacture of sweetened condensed milk from milk powder and butter oil from Australia. Developing countries anxious to attract capital and technology from the West have promulgated laws making investment attractive. Privileges include the right to import machinery and equipment free of duty and to remit interest, profits and capital repayments to the overseas partner.

The Australian Dairy Board agreed to provide a loan to the new Thai company for the purchase of processing machinery and equipment and to be responsible for management. In return the Thai company undertook to purchase all milk powder and butter oil from Australia, at prices not in excess of ruling world prices. In the next few years the Australian Dairy Board were to participate in joint venture companies along the same lines in five countries of South East Asia. In this way a market was created for over 50,000 tonnes of milk powder a year from Australia. In order to provide a supply of cans of a high standard it was usual for these installations to include can-making machinery.

In Thailand, our Mali brand sweetened condensed milk came on to the market in 1965.

My staff included a Production Manager, an Engineer and a Quality Control Officer from Australia, all of whom would be replaced as Thai staff were trained to take over these posts. Once people were satisfied that the local product was as good as imported condensed milk, Mali brand milk became popular and the factory was soon operating at full capacity.

Seventy-five per cent of the Thai people are farmers and three quarters of the cultivated land is used for rice production. In order to encourage cow keeping the Agricultural University in Bangkok maintains an experimental herd of cows. One of our young Thai executives, the son of a farmer, had graduated from this University. One day I was telling him of the importance of making fresh milk available in Thailand when he said, with considerable conviction, 'But the Thai people don't drink milk; my family never drinks milk.' 'So

you never drink milk?' 'Oh, I drink milk,' was his answer. Even then he did not fully appreciate that he had learnt to drink milk because it was available at the university while his family had probably never had the chance of drinking anything other than condensed milk.

After the Thai factory had been in operation for six months I was transferred to Singapore where the Australian Dairy Board had another new condensed milk plant. In 1967, after nearly three years in Singapore, I moved to Indonesia to establish a recombined milk operation which was to be a new joint venture. Indonesia has few cows apart from small herds of the Friesian breed which I assume were left behind by the Dutch. According to official statistics the total production of milk in the country was only enough to provide one litre of milk to each man, woman and child once a year.

Earlier UNICEF had tried to encourage milk production in the island of Java by building milk collection depots in locations considered suitable for cow keeping. When President Sukarno withdrew Indonesia's membership of the United Nations, UNICEF personnel were compelled to leave the country. The milk collection depots passed into the hands of middlemen and the low price they paid to farmers was no incentive to increase milk production.

Java is a lovely island with fertile soil and, in most years, a good rainfall so that crops such as rice grow well without irrigation. With a population of over 90 million Java is one of the most densely populated rural areas in the world. Thanks to the rich soil and good crops, one seldom sees signs of starvation in the island. However the diet is often deficient in protein and there is considerable malnutrition, especially among the children, most of whom are plagued with internal parasites and have little resistance to disease.

The factory built in Jakarta was equipped for the manufacture of sweetened condensed milk, recombined pasteurised milk and recombined butter. President Suharto declared the factory open on 3 July 1969 and the distribution of condensed milk was soon extended to all parts of Indonesia.

At the end of 1969 I handed over management of the

company and spent the next five months in the island of Sumatra looking for a suitable site for a future second factory. Once a site had been selected I returned to Australia and left the Australian Dairy Board. In Melbourne I joined a friend in a small consulting firm mainly engaged in negotiating new technology transfers. During the next two and a half years I also made frequent trips to Indonesia as a consultant in connection with joint venture projects.

At the end of 1972 I was invited by Mr Rajmohan Gandhi, grandson of Mahatma Gandhi, to join him in India. Some years earlier Gandhi had met Moral Re-Armament in Scotland and had decided to seek and follow God's plan for his own life and for his country. Back in India he called for men and women to join him in building a clean, strong, united nation free from corruption. Thousands responded to his call. Training camps were held in many parts of India and a permanent Training Centre for Asia was built at Panchgani, 280 kilometres south of Bombay. Gandhi now invited me to join him at this centre.

I had first come into contact with Moral Re-Armament while managing at Moreton-in-Marsh when, one weekend in London, I was invited to a meeting. Here people had an openness and friendliness which I envied, and an aim in life which I lacked. Six months later, not being able to forget that first meeting, I accepted an invitation to attend a Moral Re-Armament conference in Oxford. People spoke of finding new purpose and hope through seeking guidance from God and starting by putting right anything known to be wrong in their own lives. I realised that if I cared enough and was prepared to accept God's plan for my life I too could have a part in helping to create a just society. I saw that this could be the missing factor in the solution to all our problems from broken homes to poverty and war.

After three days I made the decision to ask God to take over my life and started to put things right. In the factory ambition and the demand for success had made me a hard taskmaster. So I apologised to my staff and told them of my decision. Friendship and understanding began to develop between us

and six months later the shareholders of the company, on an annual visit to the factory, remarked on the new spirit.

A new relationship also developed with the farmers supplying milk. Initially I resisted the thought that it was necessary for me to put right a dispute with the farmers' leader as I felt that the blame was mainly his. Finally I apologised for criticism of him behind his back and the breach was healed.

It was two years later that I left my secure position in Moreton-in-Marsh to go to Malta. Thus I launched out on an adventure in faith which was to take me to many countries. Now, forty years later living in rural India, one becomes deeply conscious of the price of poverty in human health and life and longs to see people across the world take up the task of banishing poverty and malnutrition. This book is written in the hope that it will help to point the way. If all who are concerned do take action then 200 million hungry children will be fed.

1

THE STRUGGLE

As I write I can look across the Krishna Valley to the rugged hills of India's Western Ghats. It is early June and the monsoon rains are due to reach this part of India in the next few days. For the rural poor, living in over 500,000 villages, the monsoon will decide whether they can earn enough money to stay alive in the coming year. A good monsoon, 1,700 mm to 2,500 mm of rain in this district, is essential to ensure good crops and water for a second crop where irrigation is available. Once the rains cease in October there will be little or no rain until the start of the next monsoon.

At present India's unprecedented stock of over 20 million tonnes of foodgrains will not help in providing food for poor people. The landless labourers who depend on seasonal work for a living have no money to buy relatively expensive grains, and many millions of small farmers cannot even produce enough on their meagre plots of land to provide food for the family. And the government do not have the finance to subsidise the distribution of grain to the poor and hungry. So, for over half the population of this nation of nearly 650 million people, life is a daily struggle to find enough food to keep the family alive.

In Asia, Africa and South America, the continents which make up the Third World, large numbers of people have so little income that they cannot even buy the basic food needed for normal health and growth when it is available. Year after year these people struggle to live in a situation which holds out little hope for the future. Deep depressing poverty rules the lives of a fifth of the population of the world. Any marginal improvement in the economic situation is offset by the increasing numbers of people.

It is ironical that in this age of outstanding technological achievements mass poverty is the world's greatest problem.

According to the United Nations at least 200 million children suffer from malnutrition. Of these 10 million are in danger of dying and 90 million are in a frail state of health and could not withstand a serious illness. Many of the children that survive are destined to be robbed by hunger of the chance of normal mental and physical development.

People living in poverty pay scant attention to the protein needs of infants, and most governments are far more concerned with the financial aspects of food procurement and distribution than with the nutritional needs of children.

When 10,000 die in a tidal wave or an earthquake it is headline news and people are shocked into action. On these occasions people give generously to help the victims and aid comes from many countries.

Yet in the West we do not seem to be concerned with the fact that in the Third World one child out of every five will die in the first five years of life as a result of malnutrition. The suffering and death of millions of children in a world where there is enough food to meet all basic needs passes without comment.

Many people in the rich countries are concerned at the extent of hunger and suffering in the world, especially when children are the victims. But poverty and the resultant malnutrition in the poor countries is so widespread that we close our minds to a situation for which we can see no practical solution. Whether we live in the industrialised West or in the Third World we do not like to admit the extent of man's lack of compassion in allowing this tragic suffering to continue. So we turn our backs on the problem and do our best to forget it. Or, in the West, we hope that by making a donation to a voluntary aid fund we are doing our part in meeting the need.

Even when people and government are prepared to take action they are faced with a series of vicious circles, one within the other.

Poor, underfed people have poor health and little energy, which results in low productivity, which in turn helps to keep them poor.

Small farms, inadequately fertilised and without irrigation,

can produce only one crop a year which in turn keeps the farmers poor and provides no money to buy the fertiliser and better seeds needed to produce better crops.

Development requires capital, which must come from savings, which in turn requires a reduction in consumption, but poor people have to eat all they can produce.

A low level of economic activity cannot create income from which governments derive revenue to finance developments that are essential for an increase in economic activity.

Population control is dependent on education, health services and security in old age; but the increasing number of people increases the cost of these services and governments are unable to catch up.

So poverty begets poverty, and for the poor poverty becomes a way of life from which there does not appear to be any escape.

Little wonder that people living in poverty seem to accept this as the only way of life open to them. They so learn to live with the intolerable that they develop a remarkable capacity to survive. We who have not needed to live in such circumstances, feel that people living in poverty show little initiative in attempting to improve their lot. Yet if one person in any community does take initiative others follow his lead.

One example comes from a worker whom I know personally who lives with his family in one of the Bombay chawls (poor workers' dwellings). Until recently his chawl had no piped water supply, no sanitation, and no road; but there were two wells that were dry each year between January and June. My friend decided to take the initiative and do something to improve the water supply. He stopped drinking and used some of the money to buy a rope and a bucket and started cleaning out and deepening one of the wells. Others joined him; intrigued by their initiative the landlord offered financial help to install a piped water supply. Because others caught this spirit the people living in the chawl got together and erected a room for a school.

There are very many similar examples all over the world of progress resulting from individual initiative. 'India's White

Revolution', described in chapter 10, is an excellent example of the purchasing power of some of the poorest people in the villages being increased as a result of setting up producer co-operatives.

But the fact remains that poverty is still on the increase in the Third World. Generally speaking the masses of people locked in poverty see no way of improving their conditions, and hunger and malnutrition undoubtedly contribute towards a lack of initiative. Even in those developing countries that have achieved a measure of industrial development, the poor, especially those living in rural areas, have not benefited.

Answering poverty will only be achieved through co-operation between governments and also a commitment to this objective by the Agencies of the United Nations. While many voluntary aid agencies do valuable work in the developing countries, especially at the village level, at best they can only scratch the surface of the need. A better sharing of resources, whether through changes in conditions of trade or through increased aid must be negotiated at government to government level. In democratic societies governments respond to the demands of citizens, so that answering poverty becomes the responsibility of us all. To be able to demand the right action from government requires an understanding of the situation and of the kind of action that can be taken. One purpose of this book is to try and help in bringing this understanding.

Dr Frank Buchman, the initiator of Moral Re-Armament, said, 'Suppose everybody cared enough, everybody shared enough, wouldn't everybody have enough? There is enough in the world for everyone's need but not enough for everyone's greed.'

Apart from meeting the urgent need to eliminate human suffering, an increase in purchasing power in the developing countries is essential in the interest of world trade. The industrialised nations depend in some measure on the markets of the Third World and continuing poverty in one half of the world contributes to recession in the other.

Growing poverty also constitutes a threat to world peace. Amadou-Mahtar M'Bow, Director General of the United

Nations Educational, Scientific and Cultural Organisation (UNESCO) said, 'Peace is more than simply a matter of refraining from war. If peoples are oppressed by other peoples, if populations are beset by poverty or suffering from malnutrition and sickness, if there is no determination to build a just world, there can be no lasting peace.'[1]

Men, women and children rather than technology and economics make up the real world in which we live. Too many decisions are made for purely economic reasons without giving due considerations to the needs of people and what is right. Unless development is focussed on people the problems of poverty will not be solved.

NOTE

1 Amadou-Mahtar M'Bow, Signposts for 1982, *The UNESCO Courier*, UNESCO, Place de Fontenoy, 75700 Paris, France, March 1977, pp. 6-13.

2

POVERTY

What does the West understand of poverty? Do we immediately think of the professional beggars who hang round tourists in Bombay or Bangkok? Or do we think of our own poor in Britain, Australia or in the USA? In the West to be poor is a relative state. I do not believe that there is any Western nation where a person needs to starve to death. There are, as a last resort, relief organisations or government institutions to which a person can turn for help.

But absolute poverty as the Third World knows it is different. It is more than a lack of money. It is even more than having no chance of earning money or a meal. For 800 million people, nearly four times the population of the United States, absolute poverty is a way of life from which there is no escape. Two-thirds of these people, over 500 million, live in Asia. In India nearly 300 million people have an income of less than US$ 70 a year.

Nothing is more calculated to destroy initiative and hope than to be born into a life of poverty with its associated under-employment, hunger and malnutrition. To be desperately and permanently poor and to know of no alternative. To see one's children stunted and poorly developed. To come to accept that some of the children you love will die. Rarely to experience the joy of new clothes or to know freedom from daily drudgery. Never to have a holiday. Yet cheerfully and patiently to accept this way of life because you do not believe that there is any alternative. This is the lot of the absolutely poor.

They are found in the slums, hovels and shelters that ring towns and cities in the Third World. They are found among the landless labourers and small farmers in the villages. Most of them are too proud to beg and many of them have too much self-respect to steal. So they live their lives in poverty with no expectation of any better life.

The city of Calcutta in India has become the world's symbol of poverty and squalor. A city where a million people are said to be born to live and to die on the footpath. The city where Mother Teresa and her Missionaries of Charity first established their home for the dying, known by the Bengali name of Nirmal Hridai, meaning literally purity of heart. To this home they bring those whose life is drawing to a close in lonely isolation in the streets and alleys of the city. This is poverty as the Third World knows it.

In Britain during the industrial revolution of the early nineteenth century, governments and masters of industry attempted to justify poverty and slavery on the grounds of the economic needs of the nation. The courageous leadership of humanitarians like Wilberforce and the Earl of Shaftesbury helped to end this shameful situation. They overcame the protests of those who claimed that the prosperity of Britain would be ruined without slaves to work in the plantations and child labour to work a 12 hour day in the mines and factories. Yet, following the abolition of slavery and child labour, Britain thrived and developed as an industrialised nation.

Something very similar is true today. We in the West fail to do more to help the poor countries, through increased aid or by giving them better terms of trade, because of our fear that to do so would put our own standard of living at risk. Yet we in the West need a bigger aim than our own well-being, such as a commitment to banish poverty from the world. To have such an aim could bring a new spirit of unity and purpose to the West, and increased prosperity to both the developed and developing countries through increased trade.

The extent of poverty in the Third World was emphasised by Robert McNamara, President of the World Bank. In his 1977 address to the Board of Governors of the Bank, he says:

> The truth is that in every developing country the poor are trapped in a set of circumstances that make it virtually impossible for them either to contribute to the economic development of their nation, or to share equitably in its benefits. They are condemned by the situation to remain largely outside the development process. It simply passes

them by. Nor are we talking about an insignificant minority. We are talking about hundreds of millions of people. They are what I have termed the absolute poor; those trapped in conditions so limited by illiteracy, malnutrition, disease, high infant mortality and low life expectancy as to be denied the very potential of the genes with which they were born.

Their basic human needs are simply not met. 1,200 million do not have access to safe drinking water or to a public health facility. 700 million are seriously malnourished. 550 million are unable to read or write. 250 million living in urban areas do not have adequate shelter. Hundreds of millions are without sufficient employment. These are not simply large round numbers. They are individual human beings. Most tragic of all, many of them are children. For of the total 2,000 million people in the developing countries, some 860 million are under the age of 15.

They are the chief hope of their societies' future. And yet almost half of them suffer from some debilitating disease likely to have long-lasting effects. Well over a third of them are undernourished. 290 million of them are not in school. That is the profile of absolute poverty in the developing world. And that profile cannot be altered by a development strategy that ignores it.[1]

Poor people mainly live in poor countries which cannot provide relief or welfare assistance. The most convenient way of indicating the economic condition or financial state of a country is to speak of the Gross National Product (GNP) per head of population. The GNP is a convenient measure of the wealth of a country especially for the purpose of comparing one country with another.[2] The GNP per head per annum in Bangladesh is US$ 110, in Burma US$ 120, in India US$ 150 and in many of the countries of Central Africa between US$ 70 and US$ 150. For comparison, in the Federal Republic of Germany the GNP is US$ 7,380, in the USA US$ 7,890 and in Australia US$ 6,100 (1976 figures).

Income per head is only increasing slowly in most poor

countries. In a world of increasing costs this means that the economic situation in the poorer countries is deteriorating rather than improving. For example in 32 of the poorer countries, mainly in South Asia[3] and in Africa, the rate of increase in income per head in the past 25 years, without allowing for inflation, was only 1.5 per cent. Within this 25 year period the rate of increase has fallen. While these countries had an income growth rate of 2.6 per cent between 1950 and 1960, the rate had fallen to 1.1 per cent during the period from 1970 to 1975.

World Bank figures of the increase in average income per head also highlight the growing gap between the rich and the poor nations. In the seventies the average income in the poorest countries was expected to increase by only US$ 3, from US$ 105 to US$ 108. During the same period the increase in average income in the developed world was expected to be US$ 900, from US$ 3,100 to US$ 4,000.

The developing countries themselves need to do a great deal more to overcome poverty. Figures of average income give little indication of the extremes of wealth and absolute poverty to be found in most Third World countries.

An analysis of consumption expenditure in India highlights these enormous inequalities. In 1973-74 the lowest 20 per cent of the rural population accounted for only 10 per cent of the total rural consumption. The highest 20 per cent accounted for 38 per cent. The corresponding figures for the urban areas were 9 per cent and 40 per cent.

Similarly a survey of assets of Indian rural households shows that 20 per cent of the rural households account for less than one per cent of all rural assets, each of these households had under Rs 1,000 (US$ 125) worth of assets. Four per cent of rural households owned more than 30 per cent of all rural assets; each household owned assets worth Rs 50,000 (US$ 6,250) and more.

In Latin America inequalities are particularly striking. The poorest 40 per cent of the population receive between 7 and 12 per cent of the total income. The next 40 per cent obtain between 20 and 30 per cent of the income. The richest 20 per

cent receive from 51 to 75 per cent of the income. The top 5 per cent alone attain about 30 per cent of the total income.

World Bank figures show that the poorest 20 per cent of the population in selected developing countries receive between 2 per cent and 8 per cent of the national income, while the richest 20 per cent receive between 41 per cent and 68 per cent of the national income.

Land ownership and conditions of tenancy also lead to enormous inequalities and exploitation of the poor in rural areas of the Third World. In many developing countries attempts have been made to introduce land reform, but implementation has often been obstructed by vested interests.

All too often poor people live throughout their life in the clutches of money-lenders who charge interest rates of 120 per cent and more per annum. In the majority of poor countries industrial development and economic progress is confined almost exclusively to the cities, while the majority of the people, who live in the rural areas, become poorer. Wastage of resources, bribery and corruption, and gross mismanagement all contribute to poverty and inequality of opportunity in the Third World.

But nothing the majority of the poorer countries can do, within their own resources, can totally banish poverty. They just do not have the means. Until the rate of increase in average income in the rich countries slows and in the poorer countries improves, there can be no total answer to poverty.

While the concern of the rich nations is to get richer and to have a higher standard of living, they cannot succeed in efforts to help the poor nations. In the words of Dr E.F. Schumacher, author of the best selling book *Small is Beautiful,* economics needs to be applied as if people matter. Until both the rich and the poor nations are willing to put the needs of the people first, poverty will continue to beget poverty and wealth to beget wealth.

Population growth in the Third World is a major factor in the inability of these countries to meet people's basic need. This increase results from the combined effect of large families and the increase in life expectancy.

Since the Second World War major steps have been taken, with considerable success, to lower the death rate in Third World countries. In these countries average life expectancy, in the past 25 years, has increased from 40 years to 50 years and in some countries to 60 years. This improvement is partly due to the humanitarian work of the United Nations Agencies, especially the World Health Organisation, in the control of the killer diseases such as smallpox, cholera and malaria. It took over 100 years to achieve the same increase in life expectancy in Britain during the time of the industrial revolution.

There is a tendency in the developed nations to talk as if the adoption of family planning in the Third World, and a reduction in family size to two children per family, would bring about an immediate solution to the problem of poverty. Control of family size, especially in those countries which do not have the means of supporting even the present population, is certainly essential. But the universal adoption of family planning will not automatically result in stabilising the number of people. In the Third World over 40 per cent of the population is under the age of 15 and these youngsters are potential fathers and mothers.

Health care, hygiene, education and meeting the other basic needs for a healthy life, coupled with the wise use of family planning, constitute sound population control. Widespread encouragement of birth-control and the use of contraceptives, with its inevitable encouragement of promiscuous living, will not build sound families and nations. Nor would this alone ensure that children born into the world have a chance to achieve full mental and physical development.

Practically all countries of Asia are using various methods of restricting the rate of population growth with varying degrees of success. But among the poorer people in particular, the success of family planning depends to a considerable extent on improved standards of living and education.

Dr Ernst Michanek, Director-General and Executive Chairman of the Swedish International Development Authority, has spoken of population control in the following terms:

> The international community dealing with population and family planning is convinced today that one of the principal solutions of the problem of over-production of babies is better mother and child care at the time of pregnancy and child-birth and immediately after. The build up of a system of mother-and-child stations is more and more being seen as the main road to success in the endeavour to limit births. At these stations nutritional, hygienic and contraceptive education will form the most important part of the treatment. The key drug is food.[4]

A few years ago I visited the plantation area of South India where the main crops are tea and coffee. It is customary for whole families to live and work on these estates which have a resident population of some 250,000 people. The United Planters Association of South India has, in recent years, adopted schemes for upgrading the living conditions of the plantation families. Living quarters have been improved and supplied with electric light, running water and sanitation. Child minding centres are being provided for the children of working mothers and medical services have been made available to workers and their families. The Planters Association have encouraged mothers to have fewer children by providing conditions which help to ensure that the children will live. This approach has met with considerable success, the mothers responding to the idea of having only two or three healthy children.

In developing countries, where 20 per cent of the children die before they reach the age of five years, the only security for old age is to have enough children to ensure that some will survive to look after their parents. Many years will elapse before the poor countries of the world have the necessary financial resources to provide social security and old age pensions. In this situation it is difficult to convince parents that they should have small families.

Whatever steps are taken to encourage family planning, it is estimated, by the United Nations, that world population will reach a figure of nearly 6,000 million by the year 2000 compared with the present total world population of over

4,000 million. The major part of this increase will be in Third World countries, the population of which is expected to double in the next 25 years, or even in less time in some countries. What this will mean is continuously brought home to me when travelling in a country like India where, just for the present level of development to be maintained, everything must be doubled in the next 25 years.

It has been calculated that, assuming there is no appreciable change in the present fertility and mortality rates, the population of South Asia will increase by 1,000 million by the year 2000. If it were possible to introduce a universal system for the control of family size, it would take some 35 years for the population to reach a stage of equilibrium, where the number of births matched the number of deaths. Under these circumstances the population of South Asia would still increase by 800 million by the end of this century, because the parents of the next generation are children already growing up.

By the year 2000, there will be an additional 4 people to every square kilometre in North America, but an additional 140 people will have been added to each square kilometre in South Asia. Also, unless development and improved living conditions can be shared more equitably between urban and rural areas, the rate of growth of population in the cities of South Asia will continue to be twice that of the rural areas.

Improved living standards and education will make important contributions to limiting the growth of population in the Third World, which will in turn make a major contribution to the eradication of poverty.

NOTES

1 World Bank, *Address to the Board of Governors,* Robert S. McNamara, Washington DC, September 1977, p. 11.

2 Gross National Product (GNP), is the total market value of the final goods and services produced by a nation's economy during a specific period of time, usually one year, computed before allowance is made for the depreciation or consumption of capital used in the process of production. In other words, GNP is a convenient indicator of the level of a nation's economic activity or wealth.

3 According to the World Bank countries included in South Asia are Bangladesh, Burma, India, Nepal, Pakistan and Sri Lanka.

4 Ernst Michanek, Nutrition and Development in the 1970s, *Nutrition,* edited by Bo Vahlquist, the Dag Hammarskjöld Foundation, Uppsala, Sweden, 1972, p. 19.

3

MALNUTRITION

'Absence of hunger does not necessarily mean the absence of malnutrition, and the absence of signs of malnutrition does not necessarily mean good nutrition. Many people who show no signs of malnutrition suffer from subnutrition; their whole manner of life has adapted to an insufficient supply of calories, proteins and vitamins with resultant lack of drive and initiative, avoidance of physical and mental effort and need of excessive rest.'

In these words Professor Eva Ricketts, former Professor of Home Economics and Dietetics in the University of Natal, describes the nutritional state of over half of the people of the Third World. Professor Ricketts, with fifteen years experience in the field of applied nutrition in East Africa, quotes the words of a Mexican nutrition expert: 'Anyone looking at these malnourished people could possibly get the idea that laziness, indolence, filth and fatalism are characteristic features, but we pose the question, could any individual show any noticeable reaction when the body tissues are worn out, when the body is permanently tired and the stomach empty?'[1]

The most important characteristic of malnutrition is an inadequate intake of energy (expressed as calories) and/or protein over a period of time. Protein deficiency is not likely to occur in the absence of energy deficiency except where the diet consists mainly of cassava, plantains, yams or breadfruit, foods that are extremely low in protein. This does not hold good for infants and young children whose ability to consume more food is limited, and they therefore need foods with a higher concentration of protein. Hence the unique value of protein-rich, easily digested milk for infants.

If a diet is adequate in protein but is insufficient in quantity to meet energy needs, some of the protein will be used as a source of energy. Protein/calorie malnutrition indicates a diet

with an insufficient total amount of energy as well as being low in protein.[2]

In 1969-71, 57 developing countries had average energy supplies below the basic requirement, even assuming perfect distribution of food. Distribution and purchasing power vary widely in developing countries, and a large section of these people will have had a diet deficient in energy. The diet would certainly also be deficient in protein as part of any available protein would have been used to meet energy needs.

In developing countries the working adults will usually take for themselves the largest share of any food available. This is particularly serious for the children and women in pregnancy and lactation who have additional needs which in a poor community are rarely met. The small size and poor physical development of adults in many countries are to a great extent the living record of the hunger they suffered when they were young.

Recently studies by the World Health Organisation (WHO) have shown that more than one half of child deaths under the age of five years in Latin America are directly or indirectly due to nutritional deficiencies. It is estimated that of the children less than five years of age in the developing countries 10 million are suffering from severe malnutrition, 80 million from moderate malnutrition and 120 million from the less obvious milder forms of malnutrition. Thus something in the order of 50 per cent of all young children in the developing world are inadequately nourished which, for many, will lead inevitably to premature death.[3]

This is confirmed by a recent survey among malnourished families in developing countries which showed that 50 per cent of the families had lost more than three children under five years of age.

The Food and Nutrition Research Institute in the Philippines (FNRI) estimates the average personal daily intake at 1,670 calories; the Institute recommends 2,020 calories per person per day. Nutrition surveys completed in 1971 found that the calorie intake of children aged one to three was only 64 per cent adequate and for children aged four to nine only 69

per cent adequate. The FNRI estimates 70 per cent of children and 78 per cent of pregnant women are anaemic and parasitism further aggravates the anaemia.[4] According to them 75 per cent of the population has internal parasites and 30 per cent multiple infestation.[5]

The Food Science and Applied Nutrition Unit at the University of Ibadan in Nigeria found a high mortality rate, 36 per thousand, in the one to four age group in Nigerian children, compared with 0.8 in the United Kingdom. Protein/calorie malnutrition and undernutrition play a great role during school age. This is thought to be a major factor behind the high drop-out and repeat rate of 30 per cent reported during the first years in public primary schools. Many children have to walk up to three miles to reach school, most of them without having had any real breakfast. Only a privileged few can afford to buy enough food to fill their stomachs during the lunch break. Professor Omololu, Director of the Unit says: 'No wonder that the results of school education, with long days on empty stomachs, are unsatisfactory.'[6]

A report *What Now,* prepared by the Dag Hammarskjöld Foundation in 1975, referred to the 300 million children in the Third World suffering from grossly retarded physical growth and development. The report highlights the effect of nutritional deficiencies at the weaning stage and during early life on a child's development and comments: 'If such deficiencies prevent full realisation of a child's genetic potential, what kind of world are we preparing for the end of the century?'[7]

Professor Bo Vahlquist, Professor of Paediatrics at the University Hospital, Uppsala, Sweden, a member of the Protein Advisory Group of the United Nations, studied the effects of protein/calorie malnutrition on infants. He reports: 'In a three year old child the brain weight has already reached 80 per cent of its final value and the body weight only 20 per cent. Severe malnutrition in early life, before birth as well as after, may have far-reaching effects on the brain and its functions.'[8]

The medical evidence in regard to the effect of protein/

calorie malnutrition on the mental and physical development of children is not yet conclusive. But it is only too evident that many of the children in developing countries suffer from poor physical development. If protein deficiency does in fact retard irreversibly mental as well as physical growth then, in the words of the report *What Now,* 'Even if this were only a risk and not a certainty, would it not be sufficiently terrifying to justify emergency action? The risk is all the more scandalous in that the means are available to satisfy basic needs; it is a question of distributing them more equitably.'

In 1967 the State of Bihar, India, was threatened with a serious famine due to drought. The famine was averted by a massive relief operation, which included the emergency supply of 9 million tonnes of wheat from overseas countries, mainly from the USA. Among the measures taken to avert the famine was the supervised daily feeding of about 5 million children, aged one to fourteen years. This event is described by Aykroyd in *The Conquest of Famine* in which his comment on the general effects of this feeding programme is very revealing.

> The most striking thing about the operation was the good that it did the children. After perhaps 10 weeks of regular feeding their behaviour and appearance changed. Misery was replaced by the good spirits of childhood. They put on some weight and the dull dry skin of hunger and malnutrition became less evident. Those in charge of the centres did not keep careful records of physical changes; they were not doctors and had plenty of other things to do. But they could use their eyes. All agreed that the condition of the children fed at the centres was better after the famine than it had been before the famine began. A daily meal providing 450 calories and 18 grammes of protein brought this difference, making it clear that poor village children in Bihar (or for that matter everywhere in India) are wretchedly fed at the best of times.[9]

In India it is repeatedly stressed by doctors and health workers from the villages that a major cause of malnutrition is the lack of purchasing power. They say that villagers are

compelled to give their children whatever food they can afford, however unsuitable. This is confirmed by Narendra Singh of the Central Food Technological Research Institute, Mysore, who writes:

> The food reaching the people (in India) diminishes in quantity and quality with the decreasing purchasing capacity of the individual. There is no shortage of food for the rich, as we all know. They suffer, if anything, from over-feeding. The malnutrition, under-nutrition, hunger and starvation appear only down the economic ladder. The poor are the worst affected, many of the West Bengali agricultural labourers live on one meal of boiled wheat and a pinch of salt a day, due to poverty and lack of work, according to a State Labour Department survey.[10]

It has been found in India that an increase in income does not of necessity lead to a better diet. If a better income means a shift from sorghum or millet to rice and from home-pounded rice to polished rice, the result will be a drop in protein and mineral intake. When rice is polished 29 per cent of the protein, 64 per cent of the iron and 84 per cent of the calcium and phosphorus are lost. In the same way jaggery (unrefined sugar) supplies more iron, carotene and calcium than less nutritionally beneficial refined sugar.

Recently in the State of Bihar, I was taken to visit a group of Adavasi (tribal) villages. The absence of symptoms of malnutrition among the children was most noticeable. The health worker with our party explained that these people only use home-pounded rice (unpolished) which is their staple food. In addition they make use of the water that the rice has been boiled in. I had certainly not seen children looking so well in villages in other parts of India.

Third World mothers usually breast feed babies until they are at least two years old. The child develops well for the first four to six months after which breast milk alone is insufficient. The common practice is to give a gruel made from rice, cassava, banana or similar foods in addition to the breast milk. This frequently leads to protein deficiency especially where the

infant is unable to take sufficient bulk to meet minimum needs.

In recent years there has been a tendency for some women in the Third World to discontinue breast feeding in favour of prepared infant foods. Many of these mothers are illiterate and do not understand the correct method of bottle feeding or the right proportions of food to use. Infant foods are relatively expensive, and it is understandable that a poor mother will try to make a tin of infant food last longer by reducing the amount used. Under the circumstances the infant is likely to suffer from serious malnutrition. A problem is also caused by the lack of clean water and facilities for cleaning and sterilising the equipment. So every encouragement must be given to mothers to breast feed their babies.

Health authorities in many developing countries, aware of the dangers of bottle feeding, are taking steps to discourage the practice; in some countries the advertising of baby foods has been discontinued. However, in the absence of fresh milk, prepared foods have a part in infant feeding. Some mothers do not have sufficient breast milk and the baby will suffer if no properly prepared baby food is available. In any case a supplementary food is necessary after four to six months if the baby is to develop into a healthy infant and considerable harm can result if the breast milk is supplemented with foods lacking in protein. Also some poor mothers must work in order to live and have no alternative but to discontinue breast feeding after the first few months. There is of course some abuse by mothers who consider bottle feeding a status symbol or who wish to discontinue feeding to improve their appearance.

In some Western countries people concerned with stories of malnutrition in infants, resulting from bottle feeding, agitate for the banning of the sale of infant foods in the Third World. Unfortunately, this approach could prove equally harmful if mothers were unable to supplement their breast milk, when necessary, with protein-rich food.

The real answer lies in making fresh or recombined milk available for nursing mothers and infants in developing countries. In the West we have the ability to produce all the

milk needed to ensure that no infant, anywhere in the world, needs to suffer from malnutrition. Later in the book this proposal will be outlined in the hope that people who are concerned to see that all infants have the chance of a healthy life will insist that milk be made available where it is needed.

Professor Goran Sterky, Professor of Health Care Research at the Swedish Medical Research Council, refers to women in the following terms:

> The role of women in the primary health care situation is of particular significance. In the countries of the Third World she carries, because of frequent child-births, the burden of a mortality which is relatively much higher than man's. Her workload is excruciating, in gardening, weeding the fields, collecting water, other household duties, and the rearing of the children. In this situation of overwhelming demands on her labour, primary health and community involvement lay further claims on her. She has a key role in any programme. It seems to me, therefore, that a more equitable division of labour in society is a prerequisite for successful primary health development.[11]

Repeated and frequent pregnancies are common, together with long periods of lactation and a deficient diet. Under these circumstances mothers suffer a nutritional drain, deficiency diseases and premature old age. The Indian National Institute of Nutrition states that 10 per cent of maternal deaths are due to nutritional anaemias and that the maternal mortality rate in India is eight times higher than in Australia. Inadequacy of food supplies, poverty of the masses, ignorance and food prejudices make the problems of preventing disease and death extremely difficult.

Vitamin A deficiency and the xerophthalmia-induced blindness that it causes rank with protein/calorie malnutrition and nutritional anaemia as the most serious nutritional conditions in developing countries. It is estimated that 300,000 people are blinded by xerophthalmia every year. This disease is dealt with in chapter 13.

In considering rural health care in the developing countries

UNICEF and WHO state that the gap is widening between the health 'haves' and 'have nots'. In the shanty towns and rural villages people still have no access to any permanent form of health care. Health is largely for the rich urban elite.

Less than 10 per cent of the rural population of developing countries live within walking distance (10 kilometres) of any kind of modern health facility. Three quarters of the population in most developing countries live in rural areas. But three quarters of the spending on medical care is in urban areas where three-quarters of the doctors live. Three quarters of the deaths in developing countries are caused by conditions that can be prevented at low cost, but three quarters of the medical budget is usually spent on curative services, many of them in the urban areas.

A major programme for primary health care would mean restructuring priorities in national health planning.

Development Dialogue reports that India has recently launched a new rural health scheme. 'People's Health in People's Hands' is the slogan of the new programme. According to this programme the community should become conscious of what it can do itself and when to call for assistance. It is recognised that improvement cannot be brought merely by increasing the number of doctors or the output of medicine.

Under the new programme, a community health worker, chosen by, and coming from, the community is given training and then sent back to the community with the equipment needed for his or her work. It is proposed, in the end, to cover the entire rural population of the country at the rate of one community health worker for 1,000 persons.[12]

Excellent though this scheme is, no health measure can fully succeed in the absence of an adequate diet. While much can be done to improve conditions for poor people in the Third World, it is a tragic fact that the overall nutritional status of poor people is deteriorating. The children of the world deserve a better fate. It is within the power of people in the West and Third World countries to integrate their resources to banish for ever the evil of malnutrition.

Barbara Ward has maintained for many years a ceaseless fight for the underprivileged in the developing countries. She has done much to keep their needs before people and governments. In her recent book, *The Home of Man,* the lunatic world expenditure on arms is compared with meeting the needs of nutrition in the following words:

> Children need not die of gastro-enteritis or live with the permanently maimed brains produced by protein deficiency if the world could lessen just a little its lunatic games of overkill and 'first strike capability' and 'I'm the King of the Castle' competitiveness, if it could set to work instead to counter the fundamental killers — deep-rooted, workless poverty, with the malnutrition it implies and the diseases that filth and lack of food make fatal — cholera, dysentery, measles, tuberculosis, and all other scourges which send half the world to their graves before forty and give them, year in year out, the misery and weariness of griping intestines, confused minds and aching heads.[15]

NOTES

1 E. Ricketts, *Human Ecology,* University of Natal Press, Pietermaritzburg, Natal 1973, pp. 2-3.

2 Protein/calorie malnutrition; protein is a complex compound of amino acids essential for normal health and growth. A calorie is a unit of energy and is a measure of the dietary value of food. The body requires a specific minimum calorie intake. Protein taken when the overall calorie value of the diet is below the required minimum will be used to provide energy before meeting protein needs. Protein/calorie malnutrition indicates a diet with an insufficient total amount of energy as well as being low in protein.

3 Dimensions and causes of hunger and malnutrition, *Food and Nutrition,* Vol. 1, No. 1, FAO Rome, Italy, 1975, pp. 17-26.

4 Anaemia. Iron and folate-deficiency anaemias are widely prevalent in both developed and developing countries. Pregnant women and infants from 6-18 months of age appear to be the most vulnerable groups. Iron deficiency anaemia is also linked with infections, principally hookworm and bilharzia.

5 Keith Dalton, The Undernourished Philippines, *Far Eastern Economic Review,* Hong Kong, 1 September 1978, p. 35.

6 A. Omololu, Nutrition Surveys and Nutrition Training in Nigeria, *Nutrition,* edited by Bo Vahlquist, the Dag Hammarskjöld Foundation, Uppsala, Sweden, 1972, pp. 176-182.

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10 N. Singh, *Ceres,* the FAO Review on Agriculture and Development, May/June 1976.

11 Goran Sterky, Towards Another Development in Health, *Development Dialogue,* the Dag Hammarskjöld Foundation, Vol. 1, 1978, p. 13.

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4

WORLD FOOD NEEDS

Is there enough food in the world to meet the needs of all people? What will the position be in 1985 when some countries expect to have a serious food deficit and at the end of the century when there will be 2,000 million more people to be fed? These questions must be answered if action needs to be taken now to avoid a disastrous food shortage and consequent widespread starvation.

Without doubt the earth is capable of producing all the food needed if man has the will to increase production. Meeting people's needs in our modern world requires also the will to distribute according to needs. In the Third World, man's ability to produce is often limited by the availability of land and resources.

Today food is produced according to financial returns rather than people's needs. In the West the forecast of a wheat harvest in excess of commercial demand will lead to the compulsory limitation of the area to be sown to wheat. In the Third World some crops are grown for export to earn foreign exchange while people go hungry. If world food needs are to be met now and in the future man must be willing to use the resources of the world to meet need rather than feed greed.

None will deny that it is the moral right for all who are born into the world to have the basic necessities for a decent human life including adequate food. In the privileged nations of the West about 16 per cent of a person's take home pay goes for food, in many developing nations 70 to 80 per cent. With 80 million more people being added to the world population each year an additional 30 million tonnes of grain in all forms is needed just to stand still. If this depended on opening up new lands it would mean 17 million hectares of new land brought into production every year.

Foodgrains are needed both to meet the basic energy

requirements of man and for feeding animals to produce meat and milk. In a normal diet the protein needs of an adult will be met if the energy needs are met, as all foods contain some protein. Additional protein is needed for the normal health and growth of infants and children. The question of meeting these special protein needs will be dealt with in the final chapters of the book.

The present annual foodgrain deficit in developing countries is about 35 million tonnes, of which some 10 million tonnes is imported by South Asia. On present forecasts developing countries could be faced with a net foodgrain deficit of 85 million tonnes by 1985 or up to 120 million tonnes if there are bad harvests. The cost to developing countries of importing even 85 million tonnes of grain would be in the region of US$ 9,000 million a year, an impossible financial burden for poor countries. Also the grain exporting and importing countries do not have the facilities to load, ship and unload this quantity of grain.

These figures are based on the present totally inadequate levels of food consumption in the Third World. A study by the International Food Policy Research Institute estimates that by 1990 the developing countries — excluding the communist countries — will be producing 598 million tonnes of major staple food crops, but will need to consume from 738 to 751 million tonnes if the dietary requirements of their populations are to be met. This would call for the production of an additional 140 to 153 million tonnes a year within the next ten years. Meeting this need must depend on increased production within the Third World countries, especially South Asia where there will be an additional 1,000 million people by the end of the century.

Crop failures in the drought years of 1972 and 1974 focussed attention on the urgent need for a global food reserve. Grain reserves, which represented about 100 days' consumption in the '60's, fell to below sufficient for 30 days' consumption and, in spite of good harvests since 1974, have only recovered to about 40 days' reserve.

In Latin America, since 1975, there has been a trend away

from industrialisation as the priority for development. This follows a growing realisation of the importance of agriculture and concern at the large increase in the cost of food imports. Also, the export market for food products is becoming increasingly attractive to countries such as Brazil and the Argentine. On present trends some of the countries of Latin America will become net exporters of grain in the '80s. The Argentine has an enormous potential for the increased production of foodgrains. Latin America should have the capacity to meet its own future foodgrain needs.

However in Brazil there is very considerable malnutrition and intense poverty among its rural people. Increased beef production in Central America earns high prices on the United States market, while meat and dairy products become scarcer and more expensive within the countries. This emphasises the importance of these countries meeting the food needs of their own people before growing food for export.

While there are large areas of land in Africa which can be developed for foodgrain production, such development will be costly and will take considerable time to come to fruition. In the foreseeable future Africa as a whole is likely to remain a net importer of grain, but not in unmanageable quantities. India is the tragic example of a country with overflowing granaries, with the risk of the grain being spoilt in storage, while nearly half the population are malnourished — because those who need the grain cannot afford it. The Indian government has now begun a food-for-work programme under which state governments can draw upon the central government's reserves to pay workers a part of their wages in foodgrains.

India is experiencing a steady increase in agricultural production. In 1977-78 fertiliser usage was up 25 per cent on the previous year and is expected to increase by a further 18 per cent in 1978-79. While the production of wheat continues to increase, production of coarse grains, on which the poor people depend, have dropped from 48 kilograms per head in the early '50s to 40 kilograms per head in 1971. Production of pulses, important as protein for vegetarians, has remained constant resulting in a drop in per capita availability.

India has 38 million hectares under rice, claimed to be the largest area in the world, although yields per hectare remain low. It is estimated that rice production in India will need to double in the next 15 years, which must come largely from an increase in yield per hectare.

At present only 30 per cent of India's cultivated land is irrigated while 107 million hectares or 63 per cent is suitable for irrigation.

Bangladesh has no prospect of food self-sufficiency under present conditions. The major problem is one of water management: the control of disastrous floods, which devastate the country practically every year, and the need for the efficient development of ground water supplies during the dry season. Present rice production in Bangladesh is about 10 million tonnes annually. It has been estimated that with improved inputs — seeds, fertilisers, pesticides and extension services — production can be increased to 22 million tonnes by the year 2003. If full irrigation and flood control can be undertaken, production could be increased to 51 million tonnes a year.[1]

In Pakistan, in 1976, wheat and maize production increased by over 7 per cent; rice production by nearly 12 per cent; and sugar cane by almost 25 per cent. These increases are attributed to the fact that the government made fertiliser available at subsidised prices. Also tube-wells were supplied for irrigation and tractors were distributed on concessional terms. Unless progress is made with water management and the increase of irrigation the country is unlikely to maintain recent growth rates in foodgrain production.

In 1957, when I was in Pakistan, major projects were in hand to extend the use of water from the river Indus for irrigation. At the same time irrigated land was becoming unproductive due to salination. Unless irrigated land is well drained — extremely difficult in the flat country bordering the Indus — the level of water rises to the surface of the land and water evaporates leaving the earth salty and sterile. The government of Pakistan reclaims this land by pumping down the water level with tube-wells.

In South Asia the amount of additional land suitable for cultivation is limited. Also many areas can only be brought into production if water is available for irrigation. The main hope of increased food production lies in increased yields per hectare from land already being cultivated.

Present yields of grain in Asia vary widely from country to country. Japan has the highest rice production with an average yield of 5,847 kilograms per hectare. The average rice production per hectare in India is 1,616 kilograms and in Thailand 1,865 kilograms. In Japan 98 per cent of the rice is grown under irrigation. Japanese technologists consider that extension of irrigation, drainage and flood control, together with adequate inputs, would result in a considerable increase in grain production in South Asia.

Japan has recently produced a plan to double rice production in 16 Asian countries by turning inadequately irrigated and rain fed land into properly irrigated land, particularly for rice growing. It is proposed to provide subsidiary irrigation ditches which are well maintained. The plan calls for the expenditure of US$ 54,000 million over a period of 15 years, including an amount of US$ 25,500 million already being spent on water management by the countries concerned. Business interests in Japan, Europe and North America are supporting these proposals, which also have the backing of the Asian Development Bank.

In most parts of Asia rice can be grown all the year round, if water is available. In Java, where rainfall is normally adequate throughout the year, rice in all stages of growth can be seen in adjoining fields. Throughout Asia, given the necessary irrigation, production per hectare can be increased considerably by multiple cropping, growing two or three crops a year on the same land.

It is an interesting fact that in the Third World production per hectare on small farms is much greater than on the larger ones. There are over 80 million small farmers with less than 2 hectares of land in developing countries. In Latin America over 66 per cent of rural families have no land or too small an area to make a living. In Asia agricultural families average less

than 2 hectares of arable land per family and in Indonesia the figure is nearer half a hectare. In most countries of Asia an elite group of large landowners control 20 per cent to 40 per cent of the farm area, besides having better access to credit, capital and fertilisers. In many Asian countries half the land is farmed by tenant farmers. The tenant usually pays half his gross output to the landlord and frequently has little or no security of tenure. Generally speaking a farm of 2 hectares or less is not a viable proposition.

Throughout the Third World there is an urgent need for effective land reform if food production is to be increased. This includes the splitting up of large farms and estates with the allocation of land to small farmers and landless agricultural labourers, the consolidation of fragmented holdings and the transfer of ownership of holdings to tenant farmers. Unless land reform measures include adequate arrangements for credit for the purchase of seeds, fertilisers and simple implements, land reform will remain largely ineffective. Also new marketing arrangements will usually be required to ensure that the new owners are able to sell produce in excess of their own requirements. Producer co-operative marketing organisations, on the lines of the village milk producer co-operatives described in chapter 10, ensure that the producer is paid a fair share of the market value of what he sells.

Many new irrigation schemes have been completed in South Asia. Others are being implemented with the help of loans from the World Bank and other sources. One such project is the extension of the Rajasthan Canal in North West India. This project will bring over one million hectares of dry desert land into production.

Plans are going ahead for the proposed Karnali hydro-electric undertaking in Nepal including the construction of a 210 metre high dam. Power produced at Karnali will be sold to India by Nepal and water from the dam will irrigate nearly 300,000 hectares of land. The Karnali scheme will also help to control the periodical flooding of the Ganges basin. The Government of India decided in 1978 to increase considerably the allocation of finance for irrigation schemes.

South Asia urgently needs a major, overall irrigation and water management project, to pave the way for a massive increase in food production. Details of one such project are outlined in the next chapter.

In the Third World great hopes were placed in the 'green revolution' to meet increasing food needs. The new high yielding varieties of grain could only achieve the expected results with adequate amounts of fertiliser and water. Far from being a failure the 'green revolution' has already brought major increases in foodgrain production in Asia even where inputs are limited. Increased grain yields in the future will depend largely on the use of high yielding varieties of seeds together with adequate irrigation and the use of fertilisers and insecticides.

Following the introduction of new high yielding strains of wheat and rice into India in 1967-68, production of grain rose from a previous peak of 84 million tonnes to 95 million tonnes. During the four years from 1967 to 1971 the production of rice increased by 13 per cent from an increased acreage of only 3 per cent. During the same period the production of wheat rose by 60 per cent from an increased acreage of 35 per cent.

The International Research Institute in the Philippines has recently developed a new strain of rice which matures in 65 days compared with the normal 100 days. This would make four crops a year possible where irrigation is available. New hybrid varieties of many crops are now in use in developing countries. Projections indicate that by 1985 new high yielding strains of wheat and rice will be used for 75 million hectares of land in the Far East, about half the grain growing area in the region.

In India and Pakistan high yielding strains of wheat are already being used for 37 per cent of the wheat grown. The increased use of chemical fertilisers in developing countries is essential to obtain better yields. The cost of fertiliser is too high in relation to the return, and small farmers hesitate to borrow money against uncertain future returns.

The Commonwealth Experts Group expressed concern at the continuing low usage of fertiliser in developing countries.[2]

In view of its important role they strongly recommended the adoption of a world fertiliser policy which would include measures for price stabilisation and subsidisation. They also advised the establishing of the Fertiliser Supply Scheme on a more permanent basis and action to ensure an adequate flow of investment for fertiliser plants in developing countries. The FAO Commission on Fertilisers was urged to proceed immediately in devising such a policy.[3]

The Dag Hammarskjöld Foundation publication, *What Now,* deplores the extent to which availability of fertiliser is subject to political pressures. The decision of the United States at one stage to limit the export of fertiliser to the Third World is given as an example. This led to an estimated deficit of 2 million tonnes in 1974/75 preventing the production of 20 million tonnes of cereals. Yet an estimated 3 million tonnes of fertiliser a year is used in the USA on lawns, cemeteries, gardens and golf courses.

According to the report, the dependence of many Third World countries on factors beyond their control has been increased by technological solutions isolated from other considerations. The 'green revolution', which entails the use of large quantities of chemical fertilisers, is a case in point.[4]

A recommendation has been made to the United Nations that a tax be levied on the fertiliser consumed in industrialised countries. The money realised to be used to ensure supplies to poor countries at a price they can afford to pay. Surely the immediate adoption of such a measure would be justified?

Inadequate use is made of pesticides in developing countries for the control of crop pests. The Pesticides Association of India estimates that each year India loses crops to pests, diseases and weed infestations to the value of US$ 6,000 million, equal to 18 per cent of the total food crop output. The FAO has expressed considerable concern that the share of developing countries in pesticide consumption is less than 10 per cent, which is considered to be far too little adequately to safeguard food production. Estimates of pesticide requirements by developing countries were prepared by the FAO for the 1974 World Food Conference. These indicated

that by 1985 pesticide use needed to be increased five fold over the 1971 levels.[5]

The high level of food losses occurring between harvest and consumption also causes considerable concern. The Seventh Special Session of the United Nations General Assembly called for a 50 per cent reduction in world food losses by 1985. This would mean a saving of an estimated 40 million tonnes of cereals and coarse grains a year.

The FAO is already carrying out numerous projects to reduce post-harvest losses through improved storage, handling and drying techniques. In India the Central Food Department has established Save Grain Campaign teams in different parts of the country. These teams aim to popularise sound methods of storage and techniques of pest control. To motivate farmers to improve their storage of grain the state governments provide metal bins on a deferred payment basis. By May 1977, 47,582 bins had been distributed.[6]

In developing countries losses frequently occur due to the absence of proper marketing and processing of food. In many countries a transition to new methods of marketing is taking place. Advantage needs to be taken of this opportunity to ensure that up-to-date yet simple methods are introduced. Any new technology needs to be 'appropriate' to the product and marketing conditions. Where new systems are introduced it is important to see clearly who will benefit from the change.

The use of grain for the production of meat should not take precedence over grain for human needs. The consumption of grain in Canada and the United States is over 900 kilograms per head per annum, of which only some 70 kilograms is consumed as grain, the balance being used for feeding animals for the production of meat. In the developing countries average grain consumption is about 208 kilograms per head, practically all of which is consumed as grain. Japan and Europe are catching up with North America in meat consumption, while more people in Russia and China are now eating meat.

It takes nearly 10 kilograms of cereals to produce one kilogram of beef. During the ten years to 1971 the average

energy intake in the West increased by 200 calories per head, due mainly to an increase in the consumption of meat. The time may come when Western nations will need to consider restricting meat consumption in the interest of the grain needs of the developing countries.

In 1972 and 1974 poor weather in the USSR resulted in bad harvests which would normally result in large numbers of livestock being slaughtered. With their rapidly growing demand for meat, large quantities of grain were imported in 1972 and 1975 in order to maintain and increase meat consumption.[7]

The potential world supply of fish and crustaceans is estimated to be 118 million tonnes, which is 36 per cent of the total stock. As the normal catch amounts to only half this quantity, it is likely that the yield from the oceans could be increased. This does not apply to all species as some are in danger of being exterminated.

The World Food Conference in 1974 concluded that to achieve the desired rate of increase in food production in developing countries would require a capital investment of US$ 16,000 million to US$ 18,000 million a year. While there has been some increase in the level of investment in agriculture, the amount is still well below this figure, although lending by the World Bank has been increasingly directed to the agricultural sector. Much of the World Bank lending has been from the Intermediate Financing Facility, the Third Window. These loans carry less than normal rates of interest and are of the annuity type, with a standard grace period of 7 years and final maturity of about 25 years.

If the present cultivated land in the Third World is insufficient to produce the food needed, additional land in South America and Africa can be used for this purpose. Eradication of the tsetse fly in Africa would make 7 million square kilometres of land available for farming, which it is estimated could produce 1.5 million tons of meat and grain a year.

However I believe that the answer lies in increased production from existing land, particularly in Asia, so that

food is produced where the people live who need it. This is possible if maximum use is made of technology and people and governments in both the developing and developed nations are prepared to put the needs of the people before other considerations. We must harness the resources of the world, wherever necessary, so that the basic food needs of every man, woman and child will be met.

NOTES

1 Radha Sinha, *Food and Poverty,* Ambika Publications, New Delhi, 1976, p. 18.
2 The Commonwealth Experts Group was established by the Commonwealth Heads of Government at Kingston in 1975. The Group was invited to propose a comprehensive and inter-related programme of practical measures, directed at closing the gap between the rich and the poor countries. The Group issued their Final Report in March 1977.
3 Commonwealth Experts Group, *Towards a New International Economic Order,* Commonwealth Secretariat, London, 1977, p. 45.
4 *What Now,* the Dag Hammarskjöld Foundation, p. 31.
5 *The State of Food and Agriculture,* FAO, 1977, p. 22.
6 *Ceres,* Vol. 10, No. 6. November/December 1976, p. 14.
7 *Employment Growth and Basic Needs,* ILO, p. 77.

5

AN IRRIGATION SCHEME FOR SOUTH ASIA

Every year a large volume of water from the Himalayan mountains flows through the Indian sub-continent to the sea, causing floods with serious damage to crops and loss of life. In other high rainfall areas of India only a portion of the monsoon rains are retained for irrigation during the dry time of year. The rest of the water flows to the sea, again frequently causing serious flooding and damage. Even damming individual rivers for irrigation and power generation has, in some cases, increased the risk of floods. Also during periods of heavy rain in catchment areas towards the end of the monsoon, it is often necessary to release large volumes of water from dams which are already full, again causing serious flood damage.

From time to time, over the years, suggestions have been made for major water management and irrigation schemes for the sub-continent. The urgent need for vastly increased irrigation and flood control in South Asia has been made clear in the previous chapter, and only when these needs have been met will India, Pakistan and Bangladesh be able to produce all the food they require in the future. Without irrigation other inputs, even if they are available, cannot be utilised effectively.

An overall scheme for water management is essential if South Asia is to meet the need for an additional 140 million tonnes of food in 10 years time.

Radha Sinha, in *Food and Poverty,* reports that in the USA a White House study has been made of irrigation costs in Asia. This study indicated that, in the Indian sub-continent and in South East and South West Asia, the cost of irrigating all the irrigable land — 80 million hectares — would be around US$ 30,000 million.[1]

A project of such magnitude and importance would call for financing on a 'Marshall Plan' basis, the developed nations

providing finance as grants not loans.[2] Only on this basis could sufficient finance be available to complete the project in reasonable time, without committing the countries concerned to impossibly high repayments. Also the nations benefiting from such an irrigation project would need all available funds to finance the development of agriculture in keeping with the new production potential. There would be a greatly increased demand for high yielding varieties of seeds, for fertilisers and for pesticides, and proper food handling and marketing facilities would need to be established. The implementation of land reform measures would be essential to ensure that all farmers could benefit. Agricultural research and extension services would need to be expanded and the whole infrastructure of roads, railways and essential services would need to be redesigned and extended. Such a project, implemented over, say, a ten year period, would revolutionise the life of one third of the population of the world.

Co-ordination and planning by an international consortium, under the United Nations, would be necessary. Technical knowledge and experience would need to be obtained from any part of the world where it was available. Total integration with the countries concerned would be essential and the sovereign rights of the countries of South Asia fully respected. Only with such a scheme can the growing population of Asia be adequately fed in the years ahead. It would call for generous giving and co-operation on the part of the West and for willingness on the part of India, Pakistan and Bangladesh to accept such help.

Such a project would provide employment for a large number of workers, engineers and technicians from South Asia and would need to be planned and implemented to make the maximum use of labour with the employment needs of Asia in mind. But to make water available all the year round to parched lands would indeed be a miracle. To harness the rivers so that the dreaded floods would no longer sweep across the countryside. To pave the way for an end to starvation, suffering and misery for vast numbers of men and women. And to create a situation where there need no longer be millions of

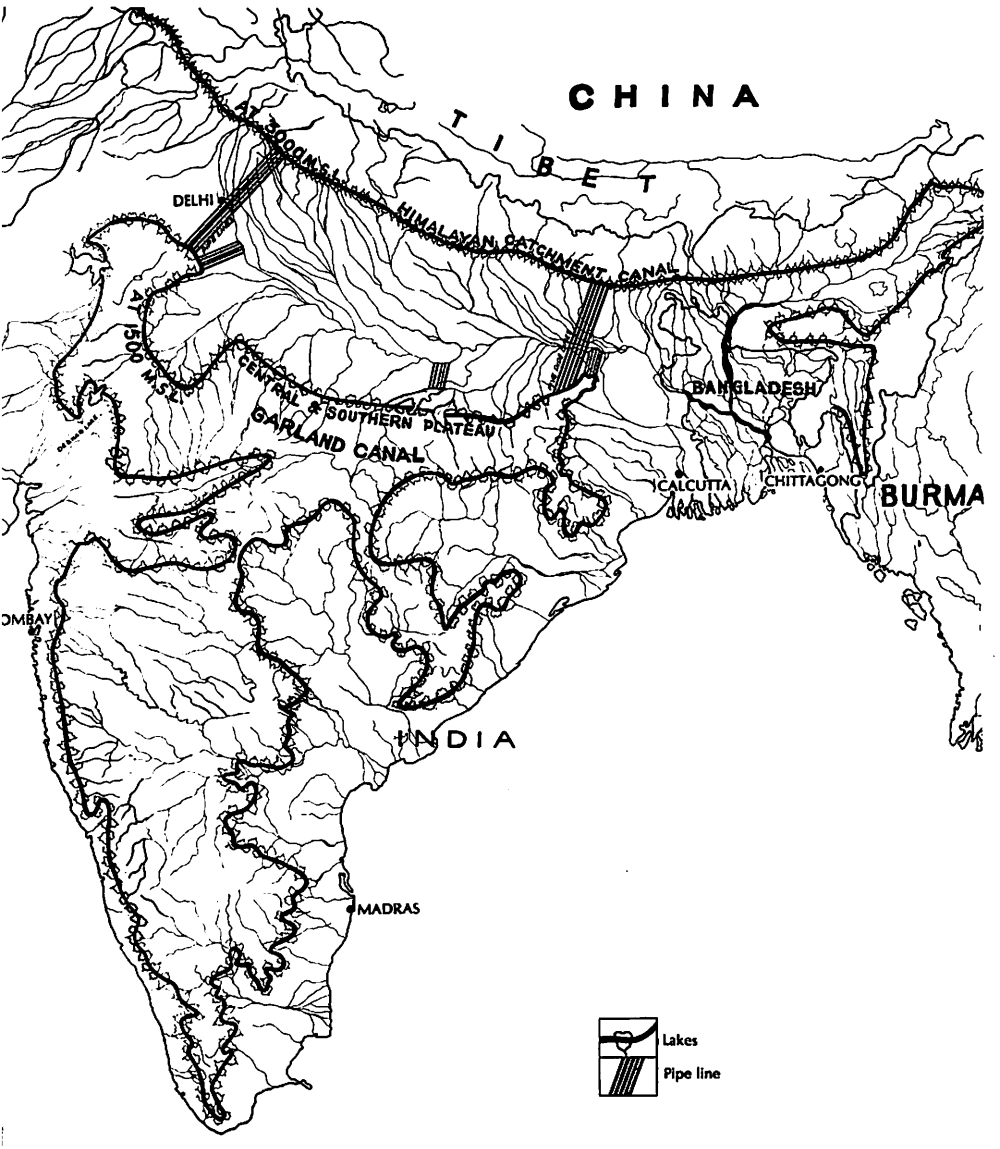
hungry children suffering from want of food. This would indeed be development worthy of the outstanding technical advances of this generation.

A project linking all the main rivers of India was outlined in 1968 by an Indian Consulting Engineer, Mr M.M. Bilaney.[3] His scheme, designed for flood control, the production of hydro-electric power and irrigation, envisaged a water grid including gates, locks and tunnels where necessary.

One man of vision, who has appreciated the revolution in living that a major water management project would bring to Asia, is Captain Dinshaw J. Dastur, a consultant of Bombay, India. Captain Dastur understands the social and economic advantages for India and the adjoining countries that would accompany the implementation of such a scheme. He has also utilised his knowledge and experience to prepare detailed plans for an overall water management project for the sub-continent. While Captain Dastur's scheme may not prove to be feasible in its present form, an irrigation project along these lines has major advantages. I give below an outline of his scheme 'Project Garland Canal' as an example of the type of project needed in South Asia.

Project Garland Canal provides for irrigation, flood control and the generation of hydro-electric power based on controlling all the rivers and their tributaries individually before they leave the gorges. Two canals — a Himalayan canal and a Central and Southern India canal — would intersect and join up all the rivers of India. The Himalayan waters would then be available for the irrigation of 220 million hectares of land in India at plain-level. (This is considerably more than the 80 million hectares of land suitable for irrigation referred to in the report from *Food and Poverty*). According to Captain Dastur at present only about 162 million hectares, out of a total of 364 million hectares of level land, are cultivable and of this area only some 50 million hectares are irrigated.

This scheme envisages the construction of a 2,000 kilometre long Himalayan canal, with over 150 integrated lakes, embracing the southern slopes of the Himalayas at about 3,000 feet above mean sea level (MSL). This canal would extend


CHINA
TIBET
DELHI
AT 3000 M.S.L.
HIMALAYAN CATCHMENT CANAL
AT 1500 M.S.L.
CENTRAL & SOUTHERN PLATEAU
GARLAND CANAL
BANGLADESH
CALCUTTA
CHITTAGONG
BURMA
INDIA
MADRAS
Lakes
Pipe line

from the Ravi in the West to join the waters of the Brahmaputra river in the East. From the Brahmaputra the canal would continue south for a further 1,860 kilometres, with about 150 integrated lakes, and would then join a river that flows into Chittagong harbour in Bangladesh. It would control and distribute about 700 million acre feet of Himalayan water every year by connecting all the glacial rivers.

This would be achieved by digging and constructing a canal 30 feet deep from ground level with an embankment on both sides about 20 feet high above the ground level. The spill water level in the canal would be at 40 feet, keeping 10 feet of height in reserve. During floods water would be held up to the 50 foot level with spill water ducts opening at the 40 foot level.

The canal would be 1,000 feet wide at the normal water holding level. Where a river flowed into the canal it would be widened to 2,000 feet for a distance of about 50 kilometres. All rivers flowing into the canal would be divided 40 kilometres before reaching the canal. This would mean that the water of the rivers would enter the canal through two courses, one natural and one man made, about 32 kilometres apart.

From the total Himalayan flow of about 700 million acre feet of water a year the Himalayan canal, including its 300 integrated reservoirs, would be capable of storing about 150 million acre feet of water, at the normal 30 foot level. If there was a sudden influx of water due to floods, this would be absorbed by the extra storage capacity of 15 million acre feet in the canal. There would also be an extra 150,000 acre feet of storage capacity in the 50 kilometres of canal length where the divided rivers enter. This portion of the canal would receive the first shock of any flood waters.

Further storage and distribution of the Himalayan canal water would be taken over by subsidiary canals at right angles to the main canal, at intervals of about 3 kilometres. These subsidiary canals would carry water from the main canal at 3,000 feet above MSL to the adjoining flat land for irrigation; at the same time this water would be used for hydro-electric power generation. These subsidiary canals would be 40 feet deep with a normal water level of 30 feet and a width of

100 feet. It is estimated that 600 such subsidiary canals would have a distribution capacity of 8 million acre feet of water a day, flowing at a velocity of 1.7 feet per second.

A Central and Southern Garland Canal would be constructed with the same dimensions and the same facilities. It would receive, store and distribute water at 1,500 feet above MSL, totally encircling the Central and Southern plateau of India. This canal would be about 9,000 kilometres long with some 600 integrated reservoirs. It would become the catchment area for all the monsoon fed rivers it connects, and the distribution reservoir for about 1,500 million acre feet of water a year. These waters would again be controlled and distributed by some 2,900 subsidiary canals of varying lengths, averaging 160 kilometres each. At the same time hydro-electric power would be generated wherever required by water flowing down into the plains from the canal.

The Central and Southern Garland Canal would have a storage capacity of about 300 million acre feet of water when the water level was 30 feet. In addition two lakes connected to the canal would have a storage capacity of 400 million acre feet of water. Further storage would be in the 2,900 subsidiary canals which would have a maximum distribution capacity of 39 million acre feet of water a day.

Care would be taken to ensure that there was a flow in both main canals of between 1.5 and 1.7 feet per second and that this flow was in both directions. Both the main and the subsidiary canals would be lined with stone to induce greater velocity and to preserve the canals.

The most irksome and difficult problem to deal with in the rivers of India is to manage the silt brought down to the plains by the rivers. In the opinion of Captain Dastur the silting of the present river beds, water retention bund areas, diversionary canals and reservoirs has the effect of giving these storage areas a life span of only 15 to 20 years. In the Garland Canal Project the silt would be trapped in filter pits and used as filling material and fertiliser. These filter pits would be located in the two courses of the divided rivers on the catchment side of the canal.

A gradient of about one foot per mile is considered satisfactory for the silt to settle in the filter pits before the water flows over into the canal. The silt would be flushed out when the gates of the filter pits were opened allowing the silt to run into the present course of the river as a slurry, under controlled conditions. The silt would subsequently be recovered and used as filling material and fertiliser. Gates would be provided at the starting end of each filter pit, so that it could be cleaned by flushing with water if required.

Further precautions would be taken to keep the main canals free from silt by providing flushing pits every 16 to 20 kilometres. All these measures would help flood control and the conservation of water without silting the main canals and integrated reservoirs.

About 15 per cent of the water of India is in the glaciers, that is about 3,000 million acre feet. The remaining 85 per cent is trapped in subterranean reservoirs or is held in the existing rivers, rivulets and surface reservoirs. These waters are replenished every year by the monsoon rains. The subterranean reservoirs at plain level would remain permanently full once the canals were built, due to underground percolation from the canals at a height of 3,000 feet and 1,500 feet above MSL. With unlimited hydro-electric power available subterranean water could be brought to the surface and used where the canals were not in a position to provide water.

The distance between the Himalayan Canal and the Central and Southern Garland Canal would be about 300 kilometres at two places. At these two places the canals would be connected by multiple pipe lines. As the difference in level between the two canals is 1,500 feet, there would be a constant flow of water all the year round from the Himalayan Canal to the Garland Canal. With the drop in level of 1,500 feet this water could be utilised for the production of hydro-electric power throughout the year.

As irrigation is extended it would be necessary to develop a satisfactory drainage system. Without adequate drainage there would be a chance of the underground water table rising,

resulting in water-logging and salination. Maximum water table level allowable is 5 to 6 feet below the surface of the ground, while the ideal level for the underground water table is 10 feet to 12 feet below ground level.

In order to maintain this level the following steps are suggested:

1 All subsidiary canals should be dug-in canals with the permanent water carrying level adjusted to 10 to 12 feet below ground level.

2 The canals should be lined, if this is considered advisable after studying the nature of the soil in which they are constructed.

3 With hydro-electric power available, underground water should be used when necessary to augment supplies in the subsidiary canals; use in this way would lower the level of the water table. During floods water could also be recycled into both main canals.

It is estimated that, once this canal system is complete, it should be possible to cultivate and irrigate 220 million hectares of land at plain level alone. In the opinion of Captain Dastur this area of land would provide employment for 300 million farmers. So, including the families, 900 million people could settle on this land and live on the proceeds of agriculture.

The energy released by the flow of water to plain level from 3,000 feet and 1,500 feet, would make possible the unlimited production of hydro-electric power. Railway lines and highways on the embankments of the canals and boats on the water would provide unlimited transport.

Captain Dastur has set out, in detail, the way in which he considers this project could be financed and implemented within India. He has also drawn attention to the considerable gains which would result from this overall irrigation project.

This brief outline of Captain Dastur's proposals for Project Garland Canal cannot do justice to the detailed planning given to this vast scheme already considered in detail by other authorities including the FAO. Year after year India is ravaged by floods and droughts, while millions of acres of flat land remains largely useless for want of water. Bangladesh cannot

feed her present population, never mind meet her future needs, in the absence of a comprehensive scheme for flood control and irrigation. The impossibility of South Asia feeding her population in the years ahead without a comprehensive project for water management has already been made clear.

In a foreword to his scheme Captain Dastur refers to China's famous 'Red Flag Canal' with dams, tunnels, canals and integrated reservoirs built by peasants using home made explosives and hand tools. He records that this huge canal passes through 134 tunnels, 300 reservoirs and more than 150 mountain side aqueducts. Project Garland Canal is a far-reaching concept which warrants international consideration at the highest level.

An age in which it has proved possible to put a man on the moon cannot reject such a scheme as impossible or too comprehensive and visionary to be implemented. I believe a scheme along these lines to be worthy of the twentieth century.

NOTES

1 Radha Sinha, *Food and Poverty*, p. 18.

2 'Marshall Plan' is the name given to the European Recovery Programme, initiated by General George Marshall, United States Secretary of State, in 1948. Under this plan the United States invited countries of Europe to submit proposals for reconstruction. The work concerned was financed by the United States to the extent of US$ 12,500 million, over a 4 year period, 90 per cent of this amount being in the form of grants which were not repayable. At the beginning of the Marshall Plan U.S. Official Development Assistance was 2.79 per cent of the GNP.

3 M.M. Bilaney, Floods in India are Man Made, *Himmat Weekly*, Bombay, 23 August 1968, p. 15.

6

EMPLOYMENT IN THE THIRD WORLD

Poverty in the Third World is largely a measure of the extent to which people have no means of earning a living wage. In India the Ministry of Economic Affairs estimates that at least 60 million people are unemployed or under-employed. *The Economic Times* of India writes of over 40 million labourers in the country districts living in abject poverty with no prescribed wage rates or regular hours of work.[1]

There are no meaningful figures of unemployment in the Third World. In a situation in which vast numbers of people have no regular employment and depend on earning what they can from casual work, statistics have little meaning. In the rural areas the majority of people have no regular work and depend on odd jobs, especially at harvest time, to earn money. In Indonesia, people working on the rice harvest are given a percentage of the rice they cut as payment. Rural families have no security and no guarantee of a regular income. People who are unorganised and desperately need work are not likely to use the urban workers' weapon — the strike — to obtain reasonable conditions and wages. At times of illness or when a daughter gets married they borrow money at high rates of interest and continue to live in a state of permanent indebtedness.

It is not surprising that in this situation children are kept home from school whenever they can get casual work. Or they stay at home to nurse the younger children while mother is working in the fields. The children are also used for gathering firewood, carrying water, collecting edible weeds, and for other odd jobs.

While it is not possible to estimate the numbers of unemployed and under-employed, it is possible to make reasonably reliable forecasts of the additional people who will be joining the work force as the population increases. For

example to employ all people seeking work for the first time in South Asia at present would require 350,000 new jobs each week. By the end of the century this figure will have risen to 750,000 jobs a week.

The International Labour Office (ILO) carries out research and field investigations into the employment situation in many countries of the world. They find that unemployment in developing countries is most extensive among the youths seeking jobs for the first time and among women. Also unemployment is often more widespread among the better educated classes. Large numbers are under-employed, due to working short hours. The most widespread and serious situation is caused by the amount of work available being too little to bring in sufficient income to meet the basic needs of the family, especially the self-employed in the informal sector. Another problem is the difficulty experienced by the heads of households who need to change their place of work, but have dependents. They must stay and earn what money they can where they are, and cannot afford the time to look elsewhere.[2]

The ILO estimates that 5 per cent of the labour force is unemployed and 36 per cent under-employed.[3] Of the total unemployed and under-employed some 80 per cent are in the rural areas. Thus the employment problem, as with the poverty problem, is largely associated with the countryside. Unfortunately rural unemployment gains little help from industrialisation in the towns and cities.

There are over 80 million small farmers in the Third World and, with the landless labourers, they constitute the majority of the under-employed rural poor. Small farmers are those with less than 2 hectares of land, frequently made up of scattered plots and incapable of producing enough to be a viable proposition. Landless labourers living in the country have no land of their own but depend on seasonal work to earn a living. They constitute one of the poorest and most depressed classes in the rural community. The number of landless agricultural labourers in India jumped from 32 million in 1961 to over 50 million in 1971.

In other countries the problem created by landless rural

people is growing rapidly. In significant areas of Indonesia the proportion of landless labourers is said to be higher than in West Bengal and Bangladesh. In Thailand and the Philippines the landless make up 10 to 15 per cent of the population over substantial areas. There is also a growing problem of rural landless people in many parts of Africa including Kenya and Lesotho.[4]

The livelihood of more than 2,000 million people, half the total population of the world, depends directly on agriculture, and of this number 1,800 million are in the Third World.

There is a close relationship between the size of holding, production per hectare and the number of workers employed for each hectare of land. This relationship between size of holding and number of persons employed has been studied by the World Bank. A limited number of such studies in Asia and Latin America have confirmed that more persons are employed per hectare on small farms.

The sub-division of big farms in developing countries would help to provide some land and an income to landless labourers. India however does not have sufficient agricultural land to provide a satisfactory holding for all the 50 million landless labourers. The extension of irrigation to all suitable land would certainly increase the potential for employment. But it is doubtful if, even then, all workers living in the rural areas could find employment.

One avenue for employment in the rural areas lies in the development of small scale industries in the villages. The government of India has recently taken steps to reserve certain industries, such as the manufacture of soap and matches, for the villages. In India one company employing 15,000 people makes 30 per cent of the matches. The other 70 per cent are made by small scale village units providing employment for 5 million people. Many village people are skilled in handicrafts and there is a demand for such products in the industrialised nations. Organisations are needed, preferably on a co-operative basis, to co-ordinate the work and to develop proper marketing channels.

When I was in Indonesia I was asked by one small factory

making beautifully hand-carved tables if I could find a market for them in Australia. I located a market and they sent over three sample tables. The buyer pointed out that, while the carving was excellent, the tables were spoilt by being poorly finished. The legs were not straight and had been screwed on with rusty screws which had not been driven home. He had intended placing an initial order for 300 tables, but took no action as he considered that the tables, as finished, would be unacceptable in Australia.

One large company in India, employing 25,000 men, is encouraging surrounding villages to meet all their needs for items which village people can be taught to produce. These include vegetables for the canteen and such items as dusters and brooms for the factory. The Welfare Department of the company do an excellent job in organising production in the villages and in supplying the simple tools and hand looms. This type of development can, I believe, prove just as advantageous for the villages as moving factories into the rural areas.

In one village in Bihar I visited a school where tribal girls were being taught to decorate saris with lovely hand embroidery. The wife of the Personnel Manager of the company I was visiting, who had organised this school, was sending the saris to Bombay to be sold.

The drift of people from the rural areas into Third World cities adds continuously to the number of urban unemployed. The population of Bombay is increasing at twice the rate of India's population as a whole, and the same movement of population makes a major contribution to the ever swelling numbers in Calcutta.

I was particularly impressed, during a visit to Calcutta, by the number of young and old relentlessly waging a daily battle to earn some money. One was assailed on every side by persistent street vendors from shoe-shine boys to orange sellers. On the grossly overcrowded suburban trains boys pushed their way into the packed carriages to sell anything from sweets to charms. One became part of the daily struggle to earn or beg money for the next meal; the struggle of thousands of city dwellers who have no regular income.

Mr T. Vittachi, Executive Secretary for World Population Year of the United Nations, stated, 'If Calcutta grows at its present rate there will be 60 million people just struggling for survival on the banks of the Hooghly (river) at the end of the century.'

In India, during the drought years of 1972 and 1974, arrangements were made to provide employment in the rural areas for destitute workers in an effort to stop the drift to the cities. The government of Maharashtra undertook extensive road works designed to employ the maximum number of men and women during this period. Roads were laboriously straightened, and cuttings made through rock by hand. Temporary traffic diversions were opened over rough gullies while bridges were being widened. It was a period of rough roads and slow travel and when driving between Poona and Panchgani one criticised the government for being out of date and not using road-making machinery. But how wrong to demand mechanical speed, rather than maximum employment under those circumstances.

In Indonesia it was the practice for city dwellers to take responsibility for each other's needs, as the country has no system of unemployment benefits. During one of my first visits to Jakarta I met one of the student leaders; at the time students were actively concerned in the removal of President Sukarno. My friend admitted that this was keeping him away from his studies, which had apparently been the case for some students for several years. So I asked how they were able to live. 'Oh,' he said, 'that is never a problem in Jakarta, someone will always give you a meal.' Later when driving in the city with my Indonesian partner he had an endless supply of ten rupiah notes, worth about two cents, which were handed out to the boys who, quite needlessly, directed the car into a parking space. Typical of Bombay are the men who squat in their 'footpath saloons' earning a living by cleaning the ears of their fellow men. One of the ear cleaners, when asked about his work, replied, 'There is nothing worth knowing about our lives, which only bring poverty, scarcity and starvation!'

Robert McNamara, President of the World Bank, states that

two thirds of the employment in the industrial sector of developing countries is in small scale informal industries. In Bombay 50 per cent of employment is in the informal sector, the shoemakers, the tinsmiths, the tailors and the multitude of small businesses, many of which consist of the owner and his assistant. Much could be done to improve the economy of these small businesses, especially if the government made credit available to them on easy terms:

In his address to the Board of Governors, McNamara spoke of the importance of small scale enterprises:

> Their expansion and increased productivity are vital to the overall growth of the economy and to the incomes of the poor. We in the Bank are still in the early stages of launching an increased effort to finance such labour intensive activities — activities that can provide productive employment at low unit capital cost. By 1980 we intend to increase our annual financial commitments to these types of operations to roughly US$ 1,300 million. We plan to work through, and where necessary to create, local financial institutions for that purpose. Urban and rural development projects will increasingly include such operations as components of the investment plan.[5]

McNamara went on to outline action already being taken in such projects in Tanzania, India and Indonesia. In Madras an urban development project will create 5,000 jobs in cottage industry activities in slum areas at an average investment cost of US$ 225 per job. Thus the earning capacity of the urban poor will be increased with only a modest investment of scarce capital. The importance of this type of labour intensive development is such that it should not be limited by lack of available funds with the World Bank, nor should the rate of interest and terms of repayment be such that a financial burden is imposed on the developing country.

The opportunities for additional employment in Third World industries cannot be exploited without increased access to overseas markets. Recognising this need, the Second General Conference of the United Nations Industrial Development Organisation (UNIDO) set new export targets for developing

countries. It was decided that their share of world manufacturing production needed to increase from 7 per cent in 1973 to 25 per cent by the year 2000. This will only be possible if the developed nations agree to a general reduction in tariffs. Such expansion would have an immediate effect on employment in both developing and developed nations. In an industry in which there is a reduction in output and demand, due to a reduction in the protection enjoyed, there will be some lowering of the numbers employed. But in a country experiencing export expansion, there will be an increase in employment opportunities. Due to the intensive use of capital equipment in the developed country and the associated high productivity of workers, the impact of a reduction of output on the number of workers employed will be far less than in the case of a developing country.

UNCTAD has made detailed calculations of the impact of a reduction in tariffs by industrialised nations on their own and Third World employment. It is estimated that the expansion of trade in a developing country to the extent of US$ 1,000 million would create initially some 135,000 jobs in the export sector and a further 125,000 jobs in associated operations. This volume of trade would displace 40,000 workers in the developed country, or 50,000 if the impact on associated industries is taken into account.

Some of the multi-national companies which have introduced new industries into developing countries accept a commitment to employ and train the maximum number of local staff. Philips of Holland at the end of 1973 were operating in 42 developing countries. Their policy is to recruit the labour force in the country in which they are operating and to replace expatriate executive staff as soon as possible with local employees. In addition Philips maintain a unique pilot plant at Utrecht, in Holland, where conditions in developing countries can be simulated. Here a way of manufacturing top quality products, more adapted to local circumstances, can be worked out. This plant is also used for training operatives and for working out training methods.

All too often planning for maximum employment in

developing countries has been ignored, and capital intensive methods have been introduced. These have included methods and technologies designed for industrialised countries with high labour costs and a shortage of labour.

McNamara quotes the example of a plastic shoe factory erected in a country like India at a cost of US$ 100,000. Such a factory will employ 40 men but will replace 5,000 shoemakers and their suppliers. It is difficult to justify replacing a hand-made leather chappal with a plastic sandle under such circumstances.

Industrialised nations seeking markets for machinery use all the techniques of modern salesmanship to win orders. Even less choice rests with a developing country, when the supply of machinery is tied to the necessary finance under an aid or loan programme. Understandably owners and managements in new industries in the Third World are proud of having the latest in modern machinery. Even Third World governments usually expect joint venture companies, established under investment laws, to import the latest and best machines. If governments would give some financial privilege to companies adopting labour intensive methods, it would help to provide additional job opportunities.

There are exceptions. I know personally of one instance where a company in an industrialised country was surprised when their application to establish a joint-venture tile factory in Indonesia was rejected by the government. The company proposed to manufacture tiles of better quality and at a lower price than the tiles being made in the villages. However the government, aware of the large number of people that would be put out of work by this new factory, refused the application. The company concerned had given little thought to the question of maximum labour utilisation.

Engineers responsible for the design of new installations for Third World countries often ignore the importance of maximum simplicity and ease of maintenance. Most developing countries have not yet had time to build up an infrastructure of spare parts and servicing facilities such as one finds in industrialised countries. Nor has there been the same

opportunity to create a pool of trained engineers and maintenance personnel. The fact that simple installations are frequently more labour intensive is another factor in favour of simplicity. Too often it is wrongly taken for granted that a mechanised or automated operation will be more efficient and more economical.

The sweetened condensed milk installation which I managed in Thailand was designed to utilise a new process developed in Australia. The process itself was an advance on any method of processing condensed milk already in use, and provision was made for fully automatic operation. This required a system of screw conveyors and load cell weighing vats for the raw materials. The complicated weighing system became inaccurate and there was no engineer in Thailand who could make the necessary adjustments. Finally we changed to manual operation. The stainless steel screw conveyor for sugar tended to jam when the moisture content of the sugar was above a specified maximum. As Thailand grows sugar we were not allowed to import fully refined sugar even if the moisture content of the sugar available was too high.

When installing a similar plant in Indonesia five years later, automatic weighing of ingredients was omitted and provision made for mixing by tipping a predetermined number of sacks of sugar and milk powder. It was also decided not to install an automatic caser which loads 48 cans of condensed milk into a carton in one operation. The interest on the capital cost of a caser, plus depreciation, maintenance and operating costs, would about equal the cost of labour for filling cartons by hand. So a hand-filling line was set up and 8 men employed on each shift instead of one man on an automatic caser. However our Indonesian partners were not really happy with having a hand operation in this modern plant. One looks forward to the day when both industrialised and developing nations will be proud of maximum labour utilisation in countries with large numbers of unemployed. Dr Schumacher, initiator of the idea of intermediate or appropriate technology, deplored the modern trend towards bigger and more complicated machines requiring less and less people to operate them. He rejected the

idea of judging progress by the ability to produce increasingly more complicated technology. His plea was for the middle way, the balance between the over-simple and the over-complicated, the way that makes the most use of the available labour force. Dr Schumacher saw that the democratic way was one where even the little people had a chance of a degree of independence. A chance of doing what the young call 'doing one's own thing'.

In Asia some managements have a policy of limiting the number of employees in a plant in the interest of industrial peace. I have heard this stated as a reason for increased mechanisation even where there is considerable unemployment. Some of the responsibility for this attitude rests with the trade union leadership, especially where there are rival unions in the same plant; workers themselves need to accept more responsibility for the actions of their leaders.

I was of the opinion that the use of tractors in Asia on all but the largest farms would needlessly reduce the demand for labour. The centre where I stay in Maharashtra has a small farm of which some 3 hectares are cultivated. On the farm a tractor makes multiple cropping possible, even to the extent of two fodder maize crops in a good monsoon. The tractor can plough the hard dry land before the rains come and gain valuable weeks, while bullocks can only plough when the rain has softened the soil. Also the ability to work the ground quickly, when there is a break in the monsoon, makes a second crop possible. As a result more labour is employed for other work, such as cutting fodder, and the number of workers employed on this farm is more than double the Indian per hectare average.

Development both in the West and in the Third World has largely ignored the need for maximum job opportunities. Today in the West we protect industries with tariff barriers to avoid loss of jobs. Surely we could do more to retrain people and direct them into other occupations which do not come into direct competition with the Third World. In Australia over-protection and 'featherbedding' are in some measure responsible for the increasing costs of production and loss of

efficiency. The victims of this state of affairs are the unemployed in both Australia and the Third World.

NOTES

1 *The Economic Times,* Bombay, February 1978, Editorial Comment.

2 International Labour Office, *Employment Growth and Basic Needs,* Tripartite World Conference on Employment, Income Distribution and Social Progress and the International Division of Labour, Geneva 1976, p. 17.

3 *Ibid,* p. 18.
Preliminary estimates of unemployment and under-employment in developing countries, by region, 1975, (in millions):

Region	*Unemployment*[a]				*Under-employment*[b]				*Total*			
	Total		*Urban*		*Total*		*Urban*		*Total*		*Urban*	
	Nos.	*%*	*Nos.*	*%*	*Nos.*	*%*	*Nos.*	*%*	*Nos.*	*%*	*Nos.*	*%*
Asia[c]	18	3.9	6	6.9	168	36.4	20	23.2	186	40.3	26	30.1
Africa	10	7.1	3	10.8	53	37.9	7	25.1	63	45.0	10	35.9
Latin America	5	5.1	5	6.5	28	28.9	14	22.8	33	34.0	19	29.3
Oceania	—	—	—	—	1	49.0	—	—	1	49.0	—	—
Total	33	4.7	14	8.0	250	35.7	41	23.3	283	40.4	55	31.3

a Defined as 'persons without a job and looking for work.'

b Defined as 'persons who are in employment of less than normal duration and who are seeking or would accept additional work' and 'persons with a job yielding inadequate income.'

c Excluding China and other Asian centrally planned economies.

Source: ILO Bureau of Statistics

4 J.W. Mellor, The Landed and the Landless, *Ceres, the FAO Review on Agriculture and Development* Vol. 11 No. 1, Rome January/February 1978, pp 42-46.

5 World Bank, *Address to the Board of Governors,* Robert S. McNamara, Washington DC, 26 September 1977, p. 24.

7

AID

Probably no international operation is more difficult to understand fully than aid. In the West ideas vary from those of people who assume that all aid is free gifts of money to the opinion that aid is wasted through misuse and corruption in either the donor or the recipient countries. Undoubtedly aid is often given with the wrong motives or in the wrong way, or is used inefficiently and fails to achieve fully the purpose envisaged by the donor or the recipient. But the transfer of resources through aid is an important international operation, without which the economic progress that has been made in both the developing and developed nations, since the Second World War, would not have been possible.

Development assistance or aid is a complex international operation, but essential until Third World countries are in a position to earn a larger share of the resources of the world. Until trade and development can be organised so that the basic needs of all people can be met, the transfer of resources from the developed to the developing country needs to continue and to be increased. Concerned men and women in the West and in the Third World must work together in the interest of sound development.

Official aid is given as multilateral or bilateral assistance. Multilateral assistance serves a number of countries and is usually channelled through international organisations, such as the Agencies of the United Nations and the Colombo Plan. Multilateral assistance also includes the provision of funds for institutions such as the World Bank Group. Bilateral assistance is aid directly negotiated between a donor and a recipient country.

In addition to official aid, including loans by governments and government agencies, the total amount of aid given to Third World countries includes loans by commercial banks

and finance institutions and investments made by commercial undertakings.

The co-ordinating body for official aid in the developed countries is the Organisation for Economic Cooperation and Development (OECD) acting through the Development Assistance Committee (DAC).[1] In general, development assistance is part of the International Development Strategy formulated by the United Nations.

Much of the aid as loans is either from international banks or the World Bank with its two affiliates, the International Development Association (IDA) and the International Finance Corporation (IFC). Loans are at varying rates of interest and terms of repayment. Prior to the '70s over 50 per cent of loans to developing countries were at stiffer than commercial terms in regard to rates of interest and periods for repayment. To meet the increasingly urgent needs of the less developed or poorer countries in particular, official loans are now made available to these countries on easier terms for specific projects. For example the Asian Development Fund (ADF), with a capital of approximately US$ 500 million, operates as one of the concessional arms of the World Bank. The ADF lends at one per cent interest with maturity in 40 years and a 10 year grace period before capital repayments start. Loans from the World Bank usually include a package of technical advice and services. Mention has been made earlier of the 'Third Window' of the World Bank which lends on easy terms.

The first major aid operation was the 'Marshall Plan' in the late '40s. Following the Second World War General George Marshall, then United States Secretary of State, had the foresight to realise that the rapid reconstruction of Europe was essential to avoid economic collapse, with serious consequences to world trade. Under his direction, and with the approval of President Truman, the USA launched the European Recovery Programme (the Marshall Plan). Each country of Europe was asked to submit plans for reconstruction over a four year period; the United States met the cost of agreed programmes to the extent of US$ 12,500 million. Of this amount 90 per cent was in the form of outright grants, not subject to repayment.

During the '50s aid shifted from Europe to the developing countries, with the United States still the major donor under the Mutual Security Act designed to encourage allegiance to the United States during the cold war in Europe and confrontation with Russia. In the early '60s food surpluses in the United States and other countries were also made available under food aid programmes. It was during this period that aid shipments of skim milk powder to developing countries reached an average of 250,000 tonnes a year.

The '60s saw the emergence of aid agencies and the decision of the OECD to differentiate between official assistance to Third World countries and assistance in the form of private loans and investments. Official aid for development was designated Official Development Assistance (ODA). To qualify as ODA, aid needed to be of a concessional nature; was to contain a grant element of at least 25 per cent; and was to be administered to promote the economic development and welfare of the recipient country. Recently the DAC adopted a new target for ODA, calling for an average grant element of at least 84 per cent.

Initially aid was usually given as 'tied aid' (aid with strings). Tied aid means aid given on condition that it is used in the donor's country for the purchase of goods, payment for services or the raising of loans. Tied aid is frequently given in the form of credits for use only in the donor's country. It has been estimated that aid is worth 20 to 40 per cent more to developing countries if it is not tied; they can then obtain lower prices buying on the open market. The World Bank pointed out recently that about half the aid is still tied to use in the donor's country. Sweden gives ODA as grants without procurement restriction. However, in order to ensure the best use of these funds, Sweden requires that, wherever practicable, quotations be obtained by the recipient through international competitive bidding.

It was agreed by the United Nations in the '50s that aid should be at least 1.0 per cent of the GNP of a donor country, a target which was not reached. For the Second Development Decade the United Nations modified this target and agreed

that donor countries should aim to give 0.7 per cent of their GNP as ODA by the mid '70s. A number of donors, including the United States, did not ratify this decision. The United States is by far the largest donor in terms of money given, although only giving 0.27 per cent of their GNP. This represented US$ 45,000 million as ODA. President Carter stated, in mid 1977, that American aid should be increased to 0.5 per cent of their GNP.[2] In 1949, at the start of the Marshall Plan, ODA from the USA represented 2.79 per cent of their GNP.

Total aid from OECD nations between 1966 and 1974 increased to an average of 0.81 per cent of their GNP. During the same period the ODA proportion dropped from 0.44 per cent to 0.33 per cent. This indicates a willingness to make investments in developing countries and give loans rather than give outright financial assistance. In 1975 aid in all forms reached the one per cent figure of which ODA was an average of 0.36 per cent of the GNP. Net aid from Communist countries has remained well below these figures.

ODA from the Organisation for Petroleum Exporting Countries (OPEC) in 1975 was 2.7 per cent of their GNP, and in 1976 2.1 per cent.[3]

The amount of money given as ODA has increased during the ten years ending in 1975. However, with rising costs in the developed countries, the value of aid given has not increased, if the amount is adjusted to 1964 values. During the same ten year period the average income per head in industrialised countries has increased by about 50 per cent.

One somewhat misleading practice is that, in calculating the amount of overall aid given, no allowance is made for the return flow of money from Third World countries. This was referred to by C.J. Valdes of the Philippines at a Council meeting of the FAO in 1977 when he said:

> We are told that in 1975 the net flow of financial resources to the Third World is estimated to have exceeded one per cent of the GNP of the DAC member countries for the first time since its establishment in 1961.
>
> Maybe so, but one also has to consider the return flow

from the Third World to the developed world, evaluated as follows: the total debt of developing countries is US$ 225,000 million (for 1975), of which US$ 90,000 million were commercial loans and US$ 135,000 million concessionary loans. If the commercial interest rate of 8 per cent and the concessionary rate of 4 per cent are taken into consideration, we arrive at the figure of US$ 12,600 million in annual return flow to the developed countries as interest alone. To this must be added a return flow of at least US$ 6,200 million as annual capital amortization payments on these loans. Including the other return flows, the repatriation of profits and the payment for technical services, this would give a figure of roughly US$ 25,000 million.

This is only a rough evaluation, but it should be possible for international organisations to make precise calculations and then to put figures on the official graphs.

Another member of the Council added, 'If we calculate what we (the developing countries) receive officially as aid, and the real portion of that aid that we actually get, it must be recognised that this real aid does not surpass 25 per cent, the other 75 per cent remaining in the developed countries.'

The Director-General, Edouard Saouma, agreed that net aid should be redefined in FAO documents.[4]

The point raised by Mr Valdes in regard to 'return flow' can be illustrated by reference to the joint venture recombined milk operations established by the Australian Dairy Produce Board in South East Asia. Although the Board was a statutary body, the operations were commercial companies. The capital invested by the Dairy Board in these companies, all of which were in developing countries, and the loans made to them, for the purchase of machinery, would all be included in the figures of overall aid given by Australia to the countries concerned. The companies paid interest on the capital invested and the loan, and made periodical repayments of the capital amount of the loan. All these amounts were remitted to Australia — the return flow — but would not be deducted from the figure of aid given by Australia to the countries concerned. As

pointed out above, this results in a quite misleading figure of the help being given to Third World countries and is the normal practice in all donor countries.

After studying the financial situation of the developing countries the Commonwealth Experts Group reached the conclusion that all developed countries should increase ODA to 0.7 per cent of their GNP without further delay. They went on to say, 'We believe that the present needs of developing countries require an ODA effort equivalent to at least 1 per cent of the GNP by 1980 and beyond.' They pointed out that a provision of 1 per cent of the GNP would require OECD countries to contribute only 5 per cent of the amount by which they expect to grow richer over the next decade.[5] Surely to slow down the rate at which wealth is increasing in the West by only 5 per cent would be a small sacrifice for the developed countries to make. An increase in Official Development Assistance to 1 per cent of the GNP would substantially assist the Third World. According to present World Bank projections, ODA is expected to increase to only 0.39 per cent of the GNP by 1985.

The other difficulty facing developing countries is the rapidly increasing amount of their debts. The total of these debts in 1970 was US$ 74,228 million, which by the end of 1977 had increased to US$ 203,500 million, and in 1979 is expected to reach nearly US$ 300,000 million. Debts of the non-oil-producing developing countries at the end of 1978 represented 27 per cent of their Gross Domestic Product (GDP).[6] Servicing these debts continues to be a major financial burden to the non-oil-producing countries and it is estimated that by 1985 this will absorb 21 per cent of their export earnings, without including payment of profits and interest charges to foreign investors.

In recent years many Third World countries have been compelled to borrow through commercial and banking channels at market rates, and sometimes with relatively short maturity, in order to finance development and meet servicing charges on earlier loans. All money borrowed from developed countries in this way would be included in the aid figures.

Cancellation of debts by developed countries is the subject of continued negotiations. Some DAC member countries have already cancelled the debts of certain of the poorest developing countries. It is recognised that it is inconsistent to provide aid as grants to the poorest countries and at the same time expect them to repay past aid loans granted when harder terms prevailed.

The oil crisis of the '70s resulted in a considerable drain on the overseas funds of developing countries dependent on imported oil. It also precipitated inflation and rising costs in industrialised nations, which resulted in a major increase in the price of exports to the Third World, without a corresponding increase in the price they received for primary products exported. While the trading deficit of non-oil-producing Third World countries in 1973 was US$ 11,000 million, by 1978 this deficit had increased to US$ 31,000 million and is expected to reach US$ 41,000 million in 1979.

In considering long term capital flows, the Commonwealth Experts Group expressed considerable concern at the latest projections by the World Bank. These indicated that grants and loans from all sources would increase only very modestly during the next decade, and would in fact only grow from US$ 31,000 million in 1975 to about US$ 44,000 million in 1985. They estimated this to mean a reduction of over 20 per cent in real terms and a very inadequate growth rate for the developing countries.[7]

On average 30 per cent of development assistance received by Third World countries is used for the import of food which, in many instances, could have been grown in the country concerned.

Production of food in the West has, in recent years, been based on economic factors rather than on world food needs. It is not the normal practice to produce food specifically for use in aid programmes in view of the high cost of production in Western nations. But in view of the extent of malnutrition some food aid is necessary until developing countries can grow enough food to meet essential needs.

It has been the practice in the past for the West to dispose of

surplus food to needy countries through food aid programmes, without considering the difficulties faced by such countries in making proper use of these surplus food supplies. Food as aid is of real value if its use can be integrated with local food production on a long term basis. Unless this is done there is always a risk that food aid will discourage recipient countries from developing their own food production.

People in the West find it hard to understand why we cannot always help developing countries by giving them our surplus food. If there is a sudden glut of eggs, people ask why this surplus is not given to a poor country. Or when, in Australia in 1976, we destroyed unwanted cows, because of a falling demand for milk, questions were asked as to why the meat was not given to nearby South East Asia. In times of emergency, following a national disaster, food gifts can help a country in need. But poor countries, even with many hungry people, cannot usually make use of large intermittent quantities of imported food.

Recently I was asked by one of the dairying countries whether 1,000 tonnes of skim milk powder could be used in India. They were prepared to give this milk powder free if I could give an assurance that it would go to children suffering from malnutrition. I discussed the offer with a senior official of the Maharashtra Department of Social Welfare who explained the position. 'There are,' he said, '20 million children below the age of ten years in Maharashtra State. Of these at least 10 per cent, or 2 million children, suffer from malnutrition in one form or another.'

He went on to explain that the Welfare Department carries out a supplementary feeding programme through voluntary agencies, children's institutions, hostels and tribal organisations. They have four divisional officers with staffs working in the field of child nutrition. Because of the high price of milk and the limited amount of milk powder available, they could only give milk to 200,000 children in tribal country areas and to 100,000 children in city slums. Each child was receiving 40 grammes of milk powder a day mixed with water and drunk under supervision.

He assured me that if they could obtain additional supplies of free milk powder, they would extend the operation to include more children. But to appoint and train additional staff would take time, and it would be necessary to continue the supplementary feeding for at least five years to gain full benefit. He asked whether the donor country could guarantee a supply of milk powder for at least five years, even a smaller quantity? I passed this information on to the country concerned but heard no more.

Some years ago I read a statement by Clarence L. Miller, Assistant Secretary of Agriculture in the United States, regarding the disposal of surplus wheat. It is worth quoting his remarks:

> There seems to be a general impression widely prevalent among the people of this country (USA), that because there are a great many people in the world living on substandard diets, our surpluses could easily be disposed of by making them available to such people. Also there is the feeling that if the US Government would give surplus wheat to another country, hungry people would suddenly get fed. This all sounds good, but I want to emphasise that such is not very often true.
>
> Let's say that country X has many ill-fed people, and let's say that the US Government delivers to that country free of charge enough wheat to raise consumption levels by 5 per cent, and of course let's say that the other country's government accepts it. That government then has two choices: either to give the wheat away, or it sells it to them at the going market price.
>
> Now under ordinary conditions giving the wheat to most consumers free is utterly impossible. Who is eligible and for how much? The distribution problems are enormous. Many people receiving such a gift, at least those not too poor or hungry, will turn round and sell all or part of it on the local market. In any case, local prices of food commodities are likely to drop severely — and this is difficult for any government in an underdeveloped country whose economy is primarily agricultural. And

these are the countries that need assistance. True there would probably be a significant increase in total food consumption, but only at the cost of widespread disruption of local markets and producer income levels.

Now let's assume the receiving government takes the second choice, namely of selling the gift wheat to consumers at the going local price. Can this result in any increase in total food consumption? In some cases it does eventually, but in many situations it can only replace wheat that would have been consumed anyway.

Regardless of how the receiving government chooses to distribute its imports under our surplus disposal programme, there must be a net addition to total food consumption before we can really say that we have done any good. Now this can and does happen, but income and consumer buying power must be increasing at the same time in order to absorb the increasing supplies.

Sir Richard Trehane, former Chairman of the Milk Marketing Board of England and Wales, in his Annual Report for 1975, speaking of the EEC export policy said:

For too long exports have tended to be regarded principally as a means of surplus disposal. The World Food Conference held in Rome last November highlighted the extent to which the developed countries had failed to discharge their obligations to the developing world. This will always be the case if food aid is regarded as the sink into which surpluses are poured.

Furthermore the infrastructure to handle food aid supplies will be created and the wastage and frauds that sadly occur will be avoided, only if supplies are assured year in year out. One has but to see the progress that has been made in India through Operation Flood (see next chapter) to realise how much can be achieved when development is planned on a long term, integrated basis.

Our European countries do themselves little credit when they operate food aid programmes for dairy products as now, making available various modest supplies

according to the stocks held by international agencies.

We would strongly support a move by the Community to go into the Third World and plan with the people there how best to develop the facilities for using food aid supplies on the basis of long term firm commitments.[8]

Food aid can make an important contribution to the nutritional needs of people of developing countries, if Western nations will plan the production and disposal of food in excess of their own requirements, in consultation with those countries. In all matters relating to the Third World interdependence and integration are two essential factors. This is particularly the case with food which is often perishable and difficult to distribute. Without proper integration and planning, efforts by the rich nations to dispose of their surplus food to the Third World are more likely to disrupt their normal channels of supply than be of benefit to people with real needs.

Above all the West must realise that starvation in the Third World cannot be answered by making food available only when there is a surplus. The way in which milk powder produced in the West could make a major contribution to banishing malnutrition in young children is discussed in a later chapter. The plea of Sir Richard Trehane that we stop using the developing countries as a sink into which to pour our surpluses should not go unanswered. The Western nations and the Third World planning together could ensure that food goes to those that need it.

NOTES

1 Organisation for Economic Cooperation and Development (OECD) members are Australia, Belgium, Canada, Denmark, Finland, France, the Federal Republic of Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, the United States.

The Development Assistance Committee (DAC) comprises Australia, Austria, Belgium, Canada, Denmark, Finland, France, the Federal Republic of Germany, Italy, Japan, the Netherlands, New Zealand, Norway, Sweden, Switzerland, the United Kingdom, the United States, the European Economic Community.

2 President Carter, USA's Aid, *Asia Week,* 18 March 1977.

3 The Organisation of Petroleum Exporting Countries (OPEC) comprises Algeria, Ecuador, Gabon, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, the United Arab Emirates, Venezuela. Not all these countries are donors of ODA.

4 *Ceres,* Vol. 10, No. 1, January-February 1977, pp. 4-5.

5 *Towards a New International Economic Order,* London 1977, p. 89.

6 Gross Domestic Product is the money value of all goods and services produced in the country. To avoid double counting only the value added at each stage of production is included.

7 *Towards a New International Economic Order,* p. 85.

8 Sir Richard Trehane, Speech to the Annual General Meeting 1975, Milk Marketing Board, Thames Ditton, England, mimeographed, p. 5.

8

INTERNATIONAL TRADE

International trade and world economic development are complementary. In a world of easy communication and advanced technology countries have a large degree of interdependence. Aid, which is being increasingly directed to development in the Third World, assumes increasing trade between the developed and developing nations. After the Second World War General George Marshall recognised the importance of a reconstructed Europe to world trade, hence the Marshall Plan.

While some developing countries have successfully adopted a measure of industrialisation, the major export of all but a few of these countries is still the raw materials of commerce and manufacture. Many of these products can only be grown in tropical and subtropical countries, but much of the production and export of these raw materials is in the hands of multinational companies based in the developed countries. Developed countries themselves, finding their manufactured goods under challenge from goods manufactured with lower cost labour in the Third World, take steps to protect their markets.

The main direction of trade is still from developed to developing countries. Exports of manufactures from industrialised countries to the Third World in 1975 were valued at US$ 123,000 million. The reverse flow of manufactures from developing countries was valued at only some US$ 26,000 million. Industrialised countries, with 35 per cent of the population of the world, still have 85 per cent of world trade.

According to the ILO, the volume of world trade between 1960 and 1974 increased at about the same pace as world industrial production. During this period the share of the non-petroleum-exporting developing countries fell. In 1960 their share of the value of total world trade was about 14 per cent.

By 1974 it had fallen to a little under 12 per cent. Even so, in comparison with previous decades, Third World trade grew rapidly until the current world recession.[1]

Many developing countries have made excellent progress in industrialisation. India's manufactured products, for example, compete successfully in many parts of the world. Some countries with new-found freedom have tended to over-emphasise industrialisation as a means to additional employment opportunities. Also the upper classes have wanted to invest money in industry and engage in management. One result is that agriculture is often neglected and food products which should be grown in the country are imported, using valuable foreign exchange. Primary production and agriculture are the backbone of the Third World, and one looks forward to the day when improved agriculture rather than new factories will become the status symbol of development.

The 'trickle down' theory motivated much of the industrialisation in the Third World. It was assumed that the benefits of economic progress in any section of the community would trickle down, and in time the standard of living in all sections would improve. In practice the reverse has proved to be the case. For example in India wages and living conditions in the industrial areas are steadily improving. Even the lowest paid employee in most industries receives a wage far in excess of the average income in the country. In many cases factories provide housing for staff and other privileges. The demand for scooters — the status symbol of the Indian factory worker — so exceeds the supply that delivery time for a new scooter is up to 10 years.

On the other hand people living in the rural areas — 75 per cent of the population — reap little benefit from industrial development. Average income in the rural areas has shown little increase, but prices generally for food and goods which they must purchase are higher due to the impact of higher wages in the towns. Other developing countries with a rural population have experienced the same failure of the 'trickle down' theory. Governments and agencies such as the World

Bank now recognise that 'trickle down' does not work and are increasingly directing aid and development to the rural areas.

Most of the Third World countries were colonised during the time of the industrial revolution. Rapidly growing industries in Europe needed the raw materials and primary products obtainable from the colonies. These countries, in turn, were valuable markets for the manufactured goods and machinery of the new industries of the West. Such factors largely decided the pattern of development and the absence of industrialisation in the colonies. The infra-structure — roads, railways and ports — was planned mainly for the shipment of primary products. I found this particularly noticeable in Indonesia, where the roads and railways converged on the ports with only limited communication between country centres.

While the transfer of industry to the Third World is encouraged by investment laws such development still has many limitations. Industry in the West represents a major capital investment, and transfer to a developing country must anticipate a desire on the part of that country to assume a controlling interest. While developing countries would like to process their own raw materials, much of the structure of Western industry is based on the manufacture and sale of finished goods.

Practically all industrial research takes place in developed countries, and often many years of patient and costly work are necessary before a new product can be launched on the market. Also much research is expended on ideas that are not commercially viable. Companies spending large sums on research hope to recover part of this expenditure from new products. This is one reason for the slow rate at which new technology is made available to Third World countries. The royalties expected by a developer on a new product often exceed the potential value of the product to the country concerned. Also governments are reluctant to authorise the use of foreign exchange for payment of royalties, unless the product is of real value to the country or is itself a potential earner of foreign exchange.

Many new products depend on a secret process, rather than a patent, to protect them from manufacture by another company. Hence there is a reluctance to release such processes to a joint venture company, in which control may pass to the Third World partner. Even with patented processes difficulty arises where the country has no patent laws or existing laws are difficult to enforce. It is however important that the benefits of new technology be made available to the Third World, and this question is receiving increasing attention by the United Nations.

International trade is suffering from growing protection in industrialised nations, many of which face increasing unemployment. The 'Generalised System of Preferences' (GSP), whereby rich countries lower or remove tariffs on selected imports from poor countries, was adopted in 1964. But it was not until 1976 that the last — and most important — industrial signatory to the agreement, the United States, actually put it into practice.

The Commonwealth Experts Group expressed the need for improvements in the Generalised System of Preferences, and drew attention to the disappointment of developing countries that raw materials and agricultural products have been excluded. The Group also expressed the opinion that concessions made under the GSP are hedged with so many exceptions and safeguards as to become largely ineffective for long-term planning. One of the main criticisms of the system is that the products favoured under it seem to be those that are relatively unimportant to poor countries and pose little or no threat to the rich world's industry.

With industrialised countries following a policy of protectionism, new companies can find themselves facing trade barriers when wishing to export to their own countries. Shoe manufacturers transferring manufacture from Australia to South East Asia to take advantage of the lower cost of labour, have faced quota restriction when wishing to export back to Australia.

The Commonwealth Experts Group was concerned at the contention of industrialised countries that the removal of trade

restrictions would release a flood of cheap manufactures on to their markets. It said:

> This fear was exaggerated for a number of reasons. First, the industrialisation of the developing countries will yield benefits to consumers, producers and workers alike in the industrialised countries; for developing countries will quickly spend their export receipts on imports of manufactured goods and services of the kind which the developed countries are in a very good position to supply.
>
> Secondly, during the last decade the fourfold expansion of trade in manufactures among industrialised countries has increased and not reduced employment in these countries.
>
> Thirdly, imports of manufactures from the developing countries into the industrialised countries, while being crucial for employment and incomes in the former, are very small in relation to intra-developed country trade.
>
> Further, in respect of complex manufactures and processes, only very few of the developing countries have a capability of significant size, and it is unlikely that there will be any large expansion in this except in the very long term.
>
> In respect of light manufactures and other manufactured products, which are considered sensitive, we envisage special concessions only for the seriously disadvantaged developing countries. For them, even the most optimistic forecast of an expansion in capacity for export is unlikely to have any significant impact on the markets of the industrialised countries.[2]

One major area of world competition is in the textile and garment industry. Cotton is almost exclusively a product of developing countries, and the manufacture of textiles and garments can be a labour intensive operation where there is surplus labour. Under the circumstances developing countries seek to take over the world market for textiles and garments, a policy which has received considerable backing in

international forums. This trend has met with opposition from many industrialised countries with established textile industries, on the grounds that this will increase unemployment in the country concerned. The World Bank has recently questioned whether the developed countries do, in fact, benefit by retaining these industries. They consider that the United States' economy gained in the period from 1970 to 1976 by importing garments the wholesale price of which rose by only 26 per cent, while other wholesale prices increased by 66 per cent.

Technological changes as much as cheap imports have often been the reason for loss of jobs in industry. A German study quoted that between 1962 and 1975 growth of productivity in West Germany displaced 48 workers for every 1 displaced by imports from developing countries. Even in clothing the ratio was more than 3 to 1. Surely the manufacture of textiles is one area where the developed nations should anticipate the transfer of manufacture to Third World countries and start the retraining of employees now for other industries?

The smaller developing countries, concerned with the export of a range of manufactured products, are largely dependent on improving overseas markets for economic progress. Larger developing countries, especially the poorer countries, the major part of whose trade is internal, are less able to take advantage of export opportunities. The average export proportion of the GNP of developing countries is about 20 per cent. But in the case of India exports represent only 3.5 per cent of their GNP and in Bangladesh 5.5 per cent.

In March 1975 the United Nations Industrial Development Organisation (UNIDO) met in Lima to consider ways of helping developing countries to raise capital needed for their manufacturing programmes. The Lima Declaration and Plan of Action set a new target for developing countries, to expand their share of world industrial output from the 7 per cent current at that time to 25 per cent by the end of the century. This would call for a reduction in trade barriers at the industrial level and gradual change within developing countries towards more sophisticated forms of manufacture.

Unless there is a marked change in the present protectionist attitude of the industrialised countries it will be increasingly difficult for the Third World to find markets for their manufactures. Present forecasts, based on existing trade barriers, are that their share of the market in industrialised countries will be only 2.7 per cent by 1985. Electronic exports from developing countries, which were valued at US$ 3,000 million in 1973, are in particular likely to face growing competition.

One avenue of trade open to developing countries is increased trade between themselves. Up to 1973 trade in manufactures between them represented only 25 per cent of their total trade. This included re-exports by Singapore to neighbouring developing countries of manufactured products imported from the West. Argentine is a major exporter to neighbouring countries of machinery, motor vehicles and steel.

Exports of manufactures, excluding petroleum products, from eight developing countries, including India, Singapore, Brazil, Argentine and Egypt, to developing countries increased between 1973 and 1975 by 62 per cent. In 1975 the share of heavy industry products from these eight countries approached two thirds of their total manufactured exports to developing countries.

One difficulty for the developing countries is the extent to which the Western nations use wealth and technology to gain markets. Competition on over-supplied world markets often tends to force down the prices of primary products, on which many developing countries depend almost exclusively for earning foreign exchange. Also developed countries sometimes overcome their own agricultural problems by producing new products, without considering the impact such new production will have on the exports of developing countries.

Australia has considered growing sugar beet for the manufacture of sugar, but for the present has not proceeded to do so. Australia is already an exporter of cane sugar which is grown in the subtropical state of Queensland. Sugar beet would be grown in the more temperate southern part of the country. It was not envisaged that there would be any

reduction in the production of cane sugar, so beet sugar would become an additional export from Australia. Any additional sugar would compete directly with sugar grown in developing countries, which already supply 67 per cent of the world market.

A constructive approach was adopted by the Prime Minister of New Zealand, who stated recently that his country had been considering growing sugar beet. This proposal had been rejected on the grounds that the developing countries producing sugar cane should preferably expand production to meet the needs of New Zealand. This statement was referred to by Prime Minister Adams of Barbados, who is reported to have said that this was an example that the EEC should follow. 'To do so,' he said, 'would go a long way in resolving the great difficulties which presently exist in accommodating cane sugar imports into a Europe which is a net exporter of beet sugar.' At the time of writing, not only has the EEC refused to join the international sugar agreement, but has come under criticism for using export subsidies in a way which frustrates the operation of the agreement.

It is only in recent years that Australia has established a cotton industry, with considerable financial assistance from the government. Australia now exports cotton in competition with developing countries, which export over 60 per cent of the world's cotton. An editorial in the *Australian Financial Review* at the time referred to a request from the new Australian cotton seed oil producers for protection against the import of vegetable oils from South East Asia, in the following terms:

> Cotton seed oil is basically a by-product of a new Australian cotton industry — an industry established with the aid of considerable government financial assistance. It is arguable whether there was ever any justification for pubic assistance to establish a cotton industry in Australia. Certainly in narrow selfish terms it may be desirable to promote the degree of self-sufficiency which can efficiently and economically be achieved. But the fact that the major portion of the world's cotton is grown in the poorest countries is not something which any

overall and properly co-ordinated foreign policy should ignore.[5]

Rubber, almost exclusively a product of developing countries, is under continual threat from synthetics. If research, financed by industrialised countries, succeeds in producing a synthetic capable of replacing rubber, a serious blow would be inflicted on the economy of a number of developing countries. This was emphasised by the director of one of the rubber estates in Malaysia. Referring to the work done by the Rubber Research Institute in developing new uses for rubber, he expressed doubt as to the value of this work. He explained that every new product they produced encouraged the people engaged in research on synthetic alternatives to try and match the new product.

One of the most serious impacts of a synthetic product on the natural product is the case of jute. Until the development of plastics Australia packed wool, their major agricultural export, in jute wool packs. From the early '70s wool was packed almost exclusively in synthetic packs. Bangladesh is the main exporter of jute and supplies 41 per cent of the world market; jute has an 85 per cent share in the exports of the country. India has 35 per cent of the world market; with jute representing 12 per cent of India's exports. The other two exporters are Nepal and Thailand.

A recent report by the World Bank, *A Study of the Weakest Commodities Produced by the Poorest Regions,* quoted the case of jute and spoke of the world demand:

> The deterioration of jute has affected an estimated 10 million farm families — 50 to 60 million people — in Bangladesh, India, Thailand and Nepal, mostly small cultivators and rural labourers, as well as one third of the industrial labour force in Bangladesh and West Bengal. Its further decline would remove it from the world market, inflict an enormous loss of export earnings, cause major unemployment in jute mills and severely affect the income of jute growers. Unless finance could be found for expensive investment in flood control, irrigation and other large scale agricultural diversification and for industrial

reconversion, retraining of the labour force and adjustment assistance, the death of jute would cause a serious calamity to a very large number of very poor people in South Asia.[4]

I have been particularly interested in the jute question since first meeting the late Mr Robert Carmichael in Karachi in 1957. Mr Carmichael, President of the French Jute Industry and President of the European Jute Industry Association was, at that time, travelling continuously between Europe and Asia in an effort to establish the jute industry on a sound basis. He had, some years earlier, through his association with Moral Re-Armament, found a personal commitment to bring a change of motive to men which would lead to a new approach in industry. In Calcutta in 1951, he had been shocked to realise that the price being paid to India and East Pakistan (now Bangladesh) for jute was so low that many jute cultivators were dying of hunger. He was determined to obtain a fair and stable world price for jute; a price which would put the European industry on a sound basis and give an adequate return to producers.

It was not until 1965 that his efforts were finally rewarded and a world agreement on jute prices was signed in Rome. This agreement was arrived at on the basis of world needs rather than the demands of any one section of the industry.

Jute producers are once more facing a crisis. A series of recommendations are made for the rehabilitation of the industry, involving an expenditure of US$ 250 million to US$ 330 million over a period of 3 years — a small price to pay to save an industry of such vital importance to poor countries, especially Bangladesh. But it may need a man with the foresight and dedication of Robert Carmichael to save the industry, a man who is prepared, as he was, to go to any lengths to find the right answer for all who are concerned with the growing, manufacture and use of jute.

One reason given by the Australian wool industry for the change from jute to synthetic packs was that the fibres from the jute packs tended to contaminate the fine merino wool. If this was a valid reason, surely Australia could have used her

technology and well developed research organisation to produce a better quality jute pack rather than change to synthetic packs?

In Australia, in 1978, I was told that jute is again being used for wool packs. Synthetic packs have not proved altogether satisfactory and the jute pack has now been improved. I was also told that the earlier contamination of the wool with jute fibres was caused when piercing the packs to sample the wool.

The industrialised countries should make the maximum possible use of jute and resist attempts to replace it with synthetic products, in the interest of poor countries. Such action, coupled with any necessary help to the jute industry in Bangladesh, is the kind of assistance which will make a major contribution to the economy of one of the world's poorest countries.

It is tragic that armaments are one of the most important items of world trade. The production and sale of modern weapons of war, developed almost exclusively in the industrialised nations, is a profitable trade. New markets are gained by being ahead in the production of sophisticated weapons, and little regard is paid to the consequences of this trade or the way the weapons will be used. The day may well come when those who trade in arms will have their own weapons turned against them. Armaments comprise a total world trade of over US$ 1,000 million a day.

A new approach to international trade is overdue, a need which was expressed in the Second Report of the Club of Rome in the following terms:

> The world cannot be viewed any more as a collection of some 150 odd nations and an assortment of political and economic blocs. Rather the world must be viewed as consisting of nations and regions which form a world system through an assortment of interdependence.[5]

This need for a new approach was emphasised by Robert McNamara when addressing the UNCTAD Conference at Manila in 1979. He referred in particular to the new protectionism and said:

Since 1976 there has been a marked increase in protec-

tionism in the industrialised nations, and the pressures for even further restrictive measures are strong.

In the last analysis they (the pressures) reflect the attempt of organised special-interest groups in the industrialised nations, in a period of slow growth and rising unemployment, to postpone the costs of structural adjustment — and this even if it means penalizing the less organised and less articulate sections of their own society, and the weaker and poorer members of the international community.

The devices utilised to provide such protection have multiplied. In addition to the traditional tariff measures, they now include cartel-like sharing agreements; 'voluntary' export restraints; countervailing duties; subsidies and other assistance to domestic industries to sustain levels of production above those warranted by demand; government procurement procedures; and a whole spectrum of administrative non-tariff barriers.

The intent of these measures is to extend protection to certain declining industries or ailing sectors of the economy, without having to undertake the more basic steps necessary to cure the fundamental malaise.

The truth is that protectionism is inefficient, counterproductive and ultimately self-defeating because in the end it penalizes everyone. It makes impossible both the equitable — and the efficient — use of world resources.[6]

NOTES

1 *Employment Growth and Basic Needs,* ILO, Geneva 1976, p. 102.
2 *Towards a New International Economic Order,* p. 53.
3 *Australian Financial Review,* Melbourne, Australia, Editorial Comment, 20 July 1972.
4 *A Study of the Weakest Commodities Produced by the Poorest Regions,* International Bank for Reconstruction and Development, Bank Staff Working Paper No. 245, 1976, p. 1.
5 Mihajlo Mesarovic and Eduard Pestel, *Mankind at the Turning Point,* The Second Report of the Club of Rome, Hutchinson, London, March 1975.
6 Robert McNamara, *Address to the United Nations Conference on Trade and Development,* World Bank, Washington DC, 1979.

9

THE NEW INTERNATIONAL ECONOMIC ORDER

During the period between 1950 and the early '70s economic growth in the Third World was disappointingly slow. Plans and targets often failed to make adequate allowance for the impact of politics on development policies. The lack of organisation and the limited facilities in many developing countries created difficulties in implementing plans, and mistakes were made in trying to apply Western ideas not suited to local conditions. Poverty and unemployment continued to grow in the majority of the developing countries.

In 1973 the need for a major change in the approach to development was already evident. It was at this stage that the decision of the Organisation for Petroleum Exporting Countries (OPEC) to quadruple the price of crude oil precipitated a world economic crisis. The increase in oil prices, coupled with the effect of droughts in 1972 and 1973, threatened to disrupt the entire pattern of Third World development. Programmes were at risk from lack of funds and many Third World countries faced economic collapse. International action to bring an immediate improvement to the economic situation was called for.

The poor countries were encouraged by the successful challenge of OPEC to the developed countries. They joined forces with OPEC in calling for the negotiation of a new economic order. In 1974 a special session of the United Nations called for a new order, although the developed nations tabled 200 pages of reservations.

It had always been taken for granted that there was enough food in the world to meet all demands. But two years of drought in many countries, coupled with increasing world population, depleted world grain stocks. In 1974 grain available in the world was only considered to be enough for 26

days consumption. Another year of drought could have resulted in a major grain shortage and widespread starvation. The United Nations called a World Food Conference which met in Rome in November 1974. For the first time world food production and distribution was considered at international level. Decisions were reached that would ensure, if implemented, that essential food needs could always be met.

It was evident that there was a need for greater food self-sufficiency in the developing countries, and the conference agreed that an average growth rate in food production of at least 4 per cent per annum was necessary. To help developing countries to reach this target, it was decided to establish an International Fund for Agricultural Development (IFAD), for which developed countries would provide the necessary capital; US$ 1,000 million were subscribed in 1977.[1]

The Food Conference decided that a reserve emergency stock of 10 to 12 million tonnes of grain should be held in strategic locations for use in an emergency. A committee with representatives from 93 countries was appointed to be responsible for world food security. During its meeting in 1977 the committee noted that in 1976 grain production had increased throughout the world, and normal stocks, at the end of the 1976-77 season, were approaching the minimum level considered to be essential by the FAO. Unfortunately little progress had been made in establishing emergency stocks and the committee, fearing that no action would be taken until there was another food crisis, urged countries to implement the agreed policy on emergency stocks of food.

Discussions in Rome had revealed how near the world had come to a major food disaster through lack of information on world food production. It was decided to set up a Global Information and Early Warning System. This system which came into operation in March 1975, was designed to monitor, on a day-to-day basis, world food supply; assess food demand and the supply of fertilisers and other key agricultural inputs; and identify individual countries and regions where serious food shortages and worsening nutritional conditions were imminent.[2]

The Lomé Convention in 1975 brought the first real breakthrough in the creation of a New Economic Order. Forty-six African, Caribbean and Pacific States (ACP) and the nine member countries of the European Economic Community (EEC) worked out a new trade and development agreement. The EEC agreed to remove tariff restrictions on imports worth US$ 7,600 million from the countries concerned, these concessions being granted by the EEC without demanding anything in return. The Lomé Agreement came into force in April 1976 and brought a new level of co-operation between half the nations of the Third World and the EEC. The agreement provided for improved financial and aid programmes; additional financial and technical co-operation; and help in the development of new projects.

One of the most original organisms set up by the Lomé Convention was Stabex, an income stabilization mechanism. Stabex is a form of insurance against losses in the value of exports by the Third World countries concerned. In the first year of operation Stabex intervened to the extent of 73 million units of account in favour of 17 ACP countries. Approximately 56 per cent of this amount went to the less advanced countries which are not required to make any repayment.[3]

After two years in operation one of the positive results of the Lomé Convention was the benefits it had brought to the ACP countries. While adjustments and changes are needed in the working of the agreement it undoubtedly stands out as a major advance in co-operation between developed and developing countries.[4]

At the end of April 1975 the Commonwealth Heads of Government met in Jamaica. They considered together, on a constructive basis, how to deal with problems facing Third World countries. As a result a group of ten Commonwealth experts was appointed to examine the economic problems of the developing countries and to recommend ways in which remedies could be applied. The findings of this group were published in March 1977.[5]

In September 1975, the Seventh Special Emergency Session of the United Nations met in New York to continue discussions

on a New International Economic Order. One delegation that took early action to prepare adequately for this Special Session was the British delegation under the leadership of A.R.K. Mackenzie, at that time British Minister for Economic and Social Affairs at the United Nations. The British, in consultation with the United States and other industrialised nations, drew up detailed proposals for closing the gap between the rich and poor nations.

The success of the Seventh Special Session is best described in the words of Mr Mackenzie who stated later:

> Everyone agrees that the Seventh Special Session was one of the most unexpectedly constructive United Nations conferences in the last thirty years. When the developing countries saw that the developed countries this time had done their homework they responded. The moderates came towards us and left their own extremists and we began to be able to build a bridge between the two groups. We drew up a new framework of how international trade, international finance, the transfer of technology, agricultural development and other subjects should be handled.[6]

Resolution 3362, passed by the Seventh Special Session, called for action on a number of measures including the stabilisation of developing countries' earnings from primary product exports; higher prices for these exports; expanded access for manufactures to the markets of the rich countries; the transfer of additional resources to the developing countries and mitigation of their debt burden; the development of scientific and technological capacity in the developing countries and the transfer of technology to them at better terms; the control of restrictive business practices adversely affecting developing countries' trade; improved world food policies; economic co-operation among developing countries; and the restructuring of the United Nations system.

The main issue remained the need to increase the earning power of Third World countries. This would depend largely on a marketing system that would ensure a reasonable return and stable prices for commodities and raw materials. The task of

finding a solution to this question was referred to the United Nations Conference on Trade and Development (UNCTAD). The initial request by the Third World countries was for the return on commodities to be indexed to the cost of exports from developed countries. This suggestion was unacceptable, and discussions since have revolved round proposals to create a common fund for stabilising commodity prices.

From early 1976 negotiations regarding the common fund were centred mainly in the Conference on International Economic Co-operation, known as the North-South Conference, the North, representing industrialised nations, and the South, representing Asia, Latin America and Black Africa.

At the end of 1978 there were still considerable differences between the developed and developing countries regarding the common fund, and the question was referred back to UNCTAD. The main purpose of the fund is to prevent extreme fluctuations in the price paid for major raw materials produced by the developing countries and to meet the cost of buffer stocks of commodities. Prices would be stabilised by releasing stocks in time of shortage or by buying in times of over-supply. UNCTAD proposed that a start be made with ten commodities: cocoa, coffee, tea, sugar, cotton, jute, sisal, rubber, copper and tin. It is estimated that the common fund when it comes into operation will need ultimately to be financed to the extent of US$ 6,000 million, although US$ 1,000 million would be sufficient to get the fund started.

The developing countries would like to see the fund fulfil a wider role than only price support and include export promotion, research into new uses of products and diversification. For this reason they consider that the fund must be created by direct government contributions, at least initially.

At the UNCTAD V Conference in Manila in 1979 broad agreement was reached to establish the common fund for commodities with the necessary financing to be decided later. In the meantime efforts would be made to accelerate negotiations on individual commodities. There was a feeling at

Manila that the developing countries tried to cover too many subjects in a general way, and more progress would have been made had they submitted a few specific proposals on which they themselves were agreed.

In the meantime low prices paid to developing countries for raw materials have a depressing effect on the purchasing power of the Third World and with it, world trade. It is hard to justify the fact that, on the average, commodities from poor countries are increased in value by over 500 per cent in the developed countries, before they reach the consumer.

The Seventh Special Session requested the United Nations Industrial Development Organisation (UNIDO) to consult with Third World countries on ways to re-deploy some of the industrial capacity of the rich nations. The Second General Conference of UNIDO agreed that action should be taken to ensure, if possible, that the share of developing countries in total world industrial production reach 25 per cent by the year 2000.

The International Development Strategy programme for implementing the New International Economic Order stressed the need for promoting the transfer of technology to developing countries on reasonable terms and in keeping with trade and development objectives. The need for assistance to developing countries in research and the development of indigenous technology was also stressed. The suggestion has been made that regional centres be established for the transfer of technology, also that an Advisory Service be established within UNCTAD. A code of conduct for the transfer of technology is being developed by UNCTAD.

The concept of a New International Economic Order is of vital importance in world development. It is unfortunate that more publicity is not given to the aims and achievements of this New Order. Politicians need the support and encouragement of men and women if these aims are to be realised. Without such support there is a danger that important decisions, particularly those affecting world trade, will be held up by pressure groups with vested interests or political groups with ulterior motives. Successful world development depends largely

on constructive co-operation between nations within the framework of a New International Economic Order.

NOTES

1 *Towards a New International Economic Order,* p. 44.
2 *Ceres,* Vol. 10, No. 5 September/October 1977, p. 6.
3 *Ceres,* Vol. 10, No. 6 November/December 1977, p. 7.
4 *Ceres,* Vol. 11, No. 4 July/August 1978, pp. 8-9.
5 *Towards a New International Economic Order,* Report of Commonwealth Experts Group, Commonwealth Secretariat, London, 1977.
6 *New World News,* London, Vol. 24, No. 17, 1976, p. 3.

10

INDIA'S WHITE REVOLUTION

One of the most important developments in rural India is the growth of village milk producer co-operative societies. These co-operative societies are part of Operation Flood, India's nation-wide milk scheme which meets the requirement of sound development. Operation Flood is an indigenous undertaking not dependent on aid, but providing a framework for the efficient use of aid funds and overseas technical assistance. It encourages rural milk production and is meeting the need for pure, safe milk in the towns and cities of India. Above all it ensures a daily cash income to the small farmers and the landless labourers who keep one or two milking animals.

In the long term by developing rural milk production the foundation is being laid for the removal of all cattle from the towns and cities by providing an alternative supply of milk from city dairies. Milk production will become a major and important rural industry, and nursing mothers and children will be able to have the milk they need for sound health and growth. Already over one million village milk producers are members of milk producer co-operative societies. Present plans provide for the expansion of Operation Flood to include over ten million village milk producers by 1985.

The importance of Operation Flood to rural India is soon appreciated if one visits a village in the Kaira district of Gujarat in the early morning or the late afternoon and joins the villagers gathered round the village milk collection centre. Women and girls and an occasional man come with their gleaming metal vessels often balanced surely on the head. They are members of the co-operative bringing their milk to the collection centre. Each comes from a family owning one or two milking animals. The milk is measured, a sample taken for a fat test and the milk is then tipped into a milk can to be collected later. The member moves to a window and receives

cash for the milk delivered on the previous visit. Then, in the next room, concentrate feed can be bought for about half the price charged by a commercial firm. This system of village milk collection is already in operation in over 5,000 of the villages of India and each year the number grows.

Organisation of milk collection in the Kaira district is the responsibility of the Kaira District Co-operative Milk Producers' Union, referred to as the Union, located at Anand in the centre of the district. During a visit to Anand I was taken to see some of the milk collection centres by an officer of the Union. We first visited one of the larger villages with a population of over 3,000, where I met the Chairman of the Management Committee of the Society.

At the collection centre he explained that the present building had been erected in 1961 at a cost of Rs15,000 (US$ 1,875) of which Rs 6,000 (US$ 750) was contributed by the Union. The society in this village, one of the first in the district, was formed in 1947 with 66 members. At the time of my visit in 1977 there were 461 members owning 552 buffaloes and supplying 1,000 litres of milk a day in summer and up to 1,800 litres in winter.

The Chairman explained that any buffalo or cow owner was entitled to become a member on purchase of at least one Rs 5 share in the society and payment of a membership fee of Rs 1. All members received a bonus at the end of the year which was usually about 5 per cent of the value of milk supplied. The Society itself benefited from a share of the profits of the Union, from which over the years Rs 20,000 (US$ 2,500) had been given to help build a school and a health centre. Contributions had also been made towards the cost of a library, a new water supply and other improvements. The regular income from the sale of milk had certainly helped to raise living standards in this village, and the Chairman was justly proud of their 14 tractors and 32 pumping sets.

We visited another smaller, poorer village in which as far as I could see, the milk collection centre was the only brick building. The Management Committee were all ladies and four of them, including the Chairman, came to talk to us. One

of these ladies could neither read nor write, but the men seemed very satisfied with the way the society was being managed. In another village I noticed a TV set in the collection centre and learned that many of the villages with electricity now have a TV set. These sets, round which the villagers gather in the evening, are paid for jointly by the village society and the Union.

In Anand I met Dr Kurien, General Manager of the Union and Chairman of the National Dairy Development Board of India. From him I learned the story behind the Kaira District Co-operative Milk Producers' Union. Prior to 1945 milk produced in the district was sold to contractors or middlemen at throw-away prices. Some of this milk was sent by rail to Bombay, 400 kilometres away. Even with the advent of the Bombay Milk Scheme producers were still at the mercy of middlemen as only they had the equipment to pasteurise the milk so that it would keep until it reached Bombay.

Despairing at the low prices, producers sought the advice of Sadar Vallabhbhai Patel, politician, freedom fighter and colleague of Mahatma Gandhi. He advised them to form a producers' co-operative but warned that the government would consider this move to be politically motivated and would oppose it. He sent his deputy, Shri Morarji Desai, former Prime Minister of India, to the Kaira district to help to organise a co-operative. As anticipated the government refused permission for the co-operative to be formed and the producers went on strike. No milk was sent to Bombay from the district until, after 15 days, the government capitulated and the Union was formed.

The Union was to be owned entirely by registered village co-operative societies and was to be based at Anand, where a dairy would be built to receive and pasteurise milk for Bombay. The dairy would also be equipped to manufacture surplus milk into butter, cheese and other dairy products so that the Union would be able to purchase all milk offered by the village societies. In this way it was recognised from the outset that only with a guaranteed market for all milk could village production be encouraged.

By June 1948 equipment had been installed, and pasteurised milk was being sent to Bombay from two village societies producing 250 litres of milk a day. It was agreed that each village co-operative society would be managed by an elected management committee which would be responsible for looking after the milk collection centre. Staff would be appointed from the village for the centre to which members would bring their milk morning and evening. Payment for the milk would be made in cash twice a day according to the fat content. In order to encourage members to keep some milk at home, especially where they had children, it was decided to accept any milk offered, however small the quantity.

Over the years the Union at Anand had extended its range of operation until, by 1977, milk was being collected from 831 village societies with nearly 300,000 producer members owning 290,000 buffaloes and 37,000 cows. From an area of 6,800 square kilometres round Anand a peak of 600,000 litres of milk was being collected in winter which dropped to 255,000 to 300,000 litres a day in the summer period of low production. A regular quantity of milk was being sent each day by insulated rail tankers to Bombay. The balance was manufactured into butter, cheese, milk powder, baby food and even milk chocolate in the modern dairy premises at Anand. These high quality products are sold throughout India under the well-known 'Amul' brand, 'Amul' standing for Anand Milk Union Limited. Dr Kurien was rightly proud of the fact that an estimated Rs 120 million (US$ 15 million) was being added to the economy of the district each year.

I was interested to know how milk production in the district had increased to such a phenomenal extent in a period of only 30 years. I was aware of the fact that no attempt had been made to introduce large herds of cows or buffaloes and as far as I could find out, few members owned more than two milking animals. If milk production could be increased in this way in Gujarat why not all over India, or for that matter, all over Asia? I could not forget those women and girls with their few litres of milk in brass containers and the dairy at Anand handling 600,000 litres of milk a day. Who in the world

would imagine meeting the milk needs of a nation of over 600 million people in this way? And at the same time answering the biggest problem in Asia — rural poverty.

So I was taken to see the modern feed mill, owned by the Union, where 300 tonnes a day of concentrated cattle feed was being produced for sale to members. This feed, scientifically compounded from materials such as cotton seed cake, grains, molasses and other ingredients, also included all the necessary minerals. The formula was varied according to the price and availability of the different ingredients. At the village collection centre this feed was sold to members at a price varying from Rs 0.87 to Rs 0.90 a kilogram compared with a price of Rs 1.88 charged by commercial companies. A quick calculation showed that a buffalo owner could feed this concentrate at the recommended rate and still make a reasonable profit on the milk sold. Now I could start to understand why this scheme meant so much to a poor landless labourer. He, or more usually his wife, could keep a buffalo, graze it round the roads and on common rough grazing land and buy concentrate feed at the collection centre. In this way, probably for the first time, the family was assured of a small, regular cash income.

Early one morning I visited the Union's veterinary centre where a line of jeep vans were loading with medicines ready to leave on their rounds. The Senior Veterinary Officer told me that they employed 40 qualified vets. Each village was visited once a week and free medical treatment given to the cattle. First aid animal medical centres had been set up in many of the villages and a 24-hour service was maintained to deal with emergency calls.

At the Union's artificial breeding centre, said to be the largest in Asia, 80 proven Surti buffalo bulls were being kept for breeding to provide a service to all villages. Each village society was sending one of its staff to the centre for training in artificial insemination. By careful selection of the best bulls the average milk yield of buffaloes in the district has been raised to 1,000 litres a year compared with the Indian average of 500 litres.

Members with land were being encouraged to grow protein-rich lucerne for fodder, the Union making seed available at reasonable prices and providing free advisory services. In 1962 the Union sold only 300 kilograms of lucerne seed to members. By 1971 the demand had grown to 175 tonnes of seed a year to enable 35,000 farmers to grow 7,000 hectares of lucerne for their milking animals.

I started to appreciate the reason for the outstanding increase in milk production. Modern technology was being used in simple ways related to village life and needs, and an efficient organisation, owned by the producers themselves, was serving the needs of the members of the village societies. A poor villager could invest in a buffalo or a cow, confident that free advice and help would be available, and that there would always be a reliable cash market for all his milk. Behind this development was the wisdom and foresight of Dr Kurien. Not only was he giving sound leadership, but he always ensured that the Union made full use of trained professional managers, advisers and technicians in every department.

There were other interesting aspects to this village co-operative society system. Groups of ladies from the village societies are taken regularly to Anand to visit the dairy with its modern manufacturing facilities. These parties are also taken to see the feed mill and the artificial breeding centre. At the latter the process of reproduction is explained in detail which helps the ladies to understand human child-bearing and gives them a new appreciation of family planning.

During a visit to Anand in 1977 I learned that plans are in hand to introduce a human health service through the village societies. The Union proposes employing a team of doctors who will train village midwives and social workers in simple hygiene and medicine.

Recently the Union at Anand joined with five other Unions in Gujarat to form a Co-operative Marketing Federation. This body manages the marketing operations for all the Unions in the group.

The Kaira District Co-operative Milk Producers' Union represents outstanding progress through which the standard of

living of one of the most depressed classes in India is being raised. For in the Kaira district 20 per cent of the members are landless labourers and 60 per cent are small farmers with less than 1 hectare of land.

In 1964 Shri Lal Bahadur Shastri, then Prime Minister of India, visited Anand. He was so impressed by the achievements of the village producer co-operatives in the socio-economic field that he urged that milk projects, on the Anand pattern, be established throughout India.

Following the Prime Minister's visit, the National Dairy Development Board of India was formed by the central government, under the chairmanship of Dr Kurien. The Board's function was to organise Anand pattern milk producer co-operatives in all parts of India and milk treatment and distribution dairies in towns and cities. The administrative and operations Centre of the Board was located at Anand, where Dr Kurien brought together a team of engineers, dairy technologists, agriculturalists and other specialist officers. Here it was possible to show groups of farmers from other parts of India the successful operation of the producer co-operative system.

Even for Dr Kurien and his team it was not all plain sailing. In India dairy development has been largely the responsibility of state government departments which do not always welcome the transfer of control to others. Also, in many parts of India, milk was being sold through middlemen who were anxious not to lose this lucrative source of income.

But Dr Kurien had one powerful weapon, 'Operation Flood', the name given to the arrangement by which the World Food Programme (WFP) of the United Nations agreed to supply to India, free of charge, a quantity of 126,000 tonnes of skim milk powder and 42,000 tonnes of butter oil, over a 5 year period. This milk powder and butter oil was to be made available to the WFP by dairying countries, under aid programmes. India's four major cities — Bombay, Calcutta, Delhi and Madras — currently provide a milk market of between 20 and 25 million people. The agreement for 'Operation Flood' signed in 1970, stipulated that the commodities supplied free by the WFP were

to be sold by the Indian Dairy Corporation (the commercial arm of the National Dairy Development Board), to the milk processing dairies in these cities at rates equivalent to the prices paid for locally procured milk. This milk powder and butter oil would then be recombined to provide additional milk for the cities concerned. The funds generated in this way, over the life of the project, were to be used for dairy development. Plans included the expansion of the four city dairies; the establishment of new city milk plants; milk collection and chilling centres; feed mills and all the other facilities needed for increased milk production and distribution.

Through 'Operation Flood' the Dairy Board and the Indian dairy industry have already achieved far-reaching results. By mid 1977, when I last visited Anand, 18 producer co-operative societies on the Anand pattern, with 5,000 village co-operative societies and over one million members, had been established in 10 of the States of India. Additional new processing dairies had been built and commissioned in Bombay, Delhi and Madras. Feeder balancing dairies, with spray drying equipment for converting surplus milk into milk powder, were in operation in 13 strategic centres. In addition a new dairy in Calcutta and feeder balancing dairies with spray drying equipment in 2 rural centres were to be commissioned at the end of 1977. In the balancing dairies excess milk is converted into milk powder in the winter, to be recombined in city dairies to provide more milk in summer periods of low production.

In Delhi in 1977 the modern dairy of the Delhi Milk Scheme was selling 356,000 litres of bottled milk a day with 3 per cent fat at Rs 1.30 (US$ 0.15) a litre and 6,700 litres of double toned milk with 1.5 per cent fat at Rs 0.80 (US$ 0.09) a litre.[1] The newly complete Delhi Mother Dairy was selling 178,000 litres of standard milk a day, with 4.5 per cent fat, through 188 bulk vending machines, at Rs 1.00 (US$ 0.12) a half litre. The bulk vending machines deliver one half litre of milk into the container of the customer when a token representing one rupee is inserted. An attendant supplies tokens in return for the money and ensures that the automatic machine functions properly and is not tampered with.

One matter of concern was that village milk producers would be tempted to sell all their milk and malnutrition would continue to be a problem in the rural areas. This possibility was investigated in 1975 by a six-man United Nations Evaluation Mission studying the working of 'Operation Flood'. The Mission were able to report that in Gujarat more milk is retained each day by households in villages with an organised milk collection system than in villages without such a scheme.[2]

In view of the predominance of buffaloes I was surprised to find that the Union kept a large herd of pure-bred Jersey cattle for breeding purposes. Dr Kurien believes that increased production of milk will depend on cows rather than buffaloes. He explained that India already has some of the best milking buffaloes in the world, but overseas breeds of cows would out-produce these buffaloes. Crossing the local cows with bulls of overseas breeds was, he considered, the best way to ensure increased milk production.

This view is supported by results already obtained in extensive cross-breeding programmes in many parts of India. The Agricultural University at Rahuri in Maharashtra maintains a herd of 300 Indian cows, mainly Gir breed, for cross-breeding trials. The average production of these Gir cows is only 1.50 litres a day while over 300 first cross daughters are producing an average of 5 litres of milk a day on the same feed. In these experiments pure-bred Jersey and Friesian bulls are used for crossing with the Gir cows.

Milk in the cities is too expensive for the poor people to buy, and Dr Kurien is concerned that there are many millions of children in the urban areas of India still suffering from serious malnutrition. But, says Dr Kurien, one cannot reduce the price paid to poor milk producers in rural areas in order to provide cheap milk for poor children in the cities. The cities of India have a much higher average income than the rural areas, and the cities themselves should look after the needs of the urban poor. The government has plans for supplementary feeding, but at present lacks the necessary finance for a complete scheme. Steps are being taken to produce cheap protein-rich foods from local materials to counteract

malnutrition, but this takes time. Free imported skim milk powder would make it possible to produce double toned milk as a bridging operation. This is discussed later.

In 1977 Dr Kurien announced details of the second phase of 'Operation Flood', 'Operation Flood II', which it is planned to complete by 1985. With the completion of this second stage India will have 155 Milk Producer Co-operative Unions grouped into 25 Federations providing a market for all the main milk producing regions. A milk distribution system connecting the 142 major cities will also be included.

It is anticipated that the 155 Unions will handle over 18 million litres of milk a day. If development proceeds according to plan — and based on past experience it will — by 1985 production of milk in India will have increased from the present average of less than 100 grammes per head to 144 grammes. This will be a remarkable achievement in a country the size of India with a population increasing at the rate of 15 million a year.

Plans for the future include facilities for training managers, a consultative service for farmers' organisations and a Research and Development Division. Additional finance required for 'Operation Flood II' will come from further supplies of free milk powder and butter oil from the WFP and from World Bank Loans.

Dr Kurien, when announcing 'Operation Flood II', said:

> It is believed that Operation Flood II as a whole is financially viable — and, in particular, that the Federation will achieve viability within five years, thereby ensuring that, after completion of Operation Flood II, the milk producers' own organisations will be able to continue the the development of the country's modern dairy industry on a self-supporting basis. It is further believed that the actions proposed under Operation Flood II will enable the country to achieve adequacy in milk production during the 1980's, enabling 10 million milk producers and their families greatly to improve their own levels of living, while also contributing to a significant improvement in the nutritional status of the country as a whole.[3]

The lessons from India's milk production achievements can be applied in many developing countries. 'Operation Flood' is a profoundly inspiring and courageous undertaking, creating conditions under which village people can raise their own living standard through producer co-operative societies which they own. From a drop of milk in a brass container, carried on the head of a village lady down a muddy village lane, to bottles of milk in a vast modern city milk plant, is an achievement. This producer co-operative undertaking is bringing hope to millions of people living in the villages of India. This is their own revolution which can transform the rural economy and point the way to other countries of the Third World. Without doubt a major factor in this outstanding development has been the organising ability and the leadership of Dr Kurien.

As I write a newspaper cutting has come to hand indicating that Dr Kurien is now turning his attention to producer co-operatives for cotton and groundnuts. If he succeeds, producer co-operatives will replace textile and oil mill owners and a host of middlemen, in those industries. These developments will certainly help to achieve a more equitable spread of income in India.

I visited Anand four times during a period of 20 years and had discussions with Dr Kurien and members of the staff of the Union and of the National Dairy Development Board. An assessment of the achievements of the Union was given in 'Ideas and Action', a bulletin on Third World development issued by the FAO, which states in part:

> Specific ingredients in the success of AMUL appear to be as follows:
>
> * Honest, dedicated and motivated social workers of the Gandhian tradition are organisers and constitute the policy level board; society by-laws have been carefully designed to discourage vested interests and vigilance is constantly maintained;
> * Professional management and competent technicians work without interference;
> * Non-bureaucratic cadres (including local links) are responsive and accountable to the members;

* Cost-conscious efficient management with continuous concurrent audit and guidance from the Union keep the entire structure free of corruption and scandal;
* Quality control and pricing of milk are open, fair and fool-proof with no favouritism possible;
* Procedures for decision-making are democratic and so are methods of promoting innovation;
* Sound working relations have been established with other development agencies in the area;
* Most important (and the organisers lay great stress on this) AMUL is a homogeneous organisation with a single objective.[4]

NOTES

1 Toned milk is milk in which the amount of fat has been reduced by the addition of skim or fat free milk, either in the form of liquid skim milk or as skim milk powder and water. In India buffalo milk with 7 per cent fat is mixed with an equal quantity of skim milk to give a lower priced toned milk with 3.5 per cent fat. In double toned milk the fat percentage is reduced still further, usually to 1.5 per cent fat. Toned milk is an excellent protein food, especially for children.

2 Indian Dairy Corporation, *Report of the Second UN/FAO World Food Programme Evaluation Mission on Operation Flood,* India — WFP 618, Government of India, June 1976, p. 96.

3 V. Kurien, *Operation Flood II,* mimeographed, National Dairy Development Board, Anand, Gujarat, India, p. x.

4 Ideas and Action/116, *Action for Development 1977/3 — 4,* FAO, Freedom from Hunger Campaign, Action for Development, FAO, Rome, p. 19.

11

PROGRESS IN AGRICULTURAL SCIENCE IN INDIA

In the West it is often assumed that food shortages and malnutrition in the Third World are due, in some measure, to lack of progress in agricultural science and technology. Generally speaking this is not so. In many developing countries agricultural research is well advanced and related to farm needs, but difficulties arise in making the findings of science available to large numbers of small farmers. Channels of communication are long and often not well organised, and frequently farmers find it difficult to buy new varieties of seeds through normal commercial channels.

I have been most impressed with the practical research work being carried out by many of the agricultural universities in India. These Third World institutions have made major contributions to the development of new high yielding varieties of seeds, the 'green revolution'. In India the work of agricultural research establishments in these cattle cross-breeding programmes is nation-wide, so that today farmers owning one or two cows are able to cross them with bulls of overseas breeds. They now know the value of cross-breeding and are ready to walk a cow several miles to make use of the government's artificial insemination service using semen from pure-bred bulls.

The leading agricultural university in the state of Maharashtra, which has a population of about 60 million people, is the Mahatma Phule Krishi Vidyapeeth Agricultural University at Rahuri, referred to as MPKV. This university was established in 1968 in a low rainfall region subject to serious droughts, where an area of 3,291 hectares (8,130 acres) of land was selected for the university campus. Part of the area was flat fertile land, previously forming portions of six villages, and the balance rough hillsides owned by the government. All the land

when taken over was badly neglected, many fields being seriously eroded through want of proper soil conservation measures. Water for irrigation was available from a canal in part of the area.

In the late 1960s the government of India had decided to establish agricultural universities in rural areas rather than in the cities. In accordance with this policy MPKV was located 35 kilometres from the nearest town and 140 kilometres from the city of Poona.

This university is responsible for agricultural research and development in nine districts of Maharashtra, which include most of the drought-prone areas of the state. Some of the most fertile lands, watered by the two great river systems of Godavari and Krishna, are also included. Besides the central campus at Rahuri, MPKV is responsible for 3 constituent colleges of the university, 5 main research stations, 20 sub-research stations and an agricultural school in each district.

Little progress was made in the development of the central campus until a new Vice-Chancellor, Dr M.S. Pawar, took over in January 1972. Dr Pawar, an eminent Indian agricultural scientist in the field of genetics, had just completed a six year assignment with the FAO in Guyana, where he had worked on new, high yielding varieties of rice. He was also a good organiser and a man dedicated to sound agricultural development in India. On taking up his appointment he found that most of the university staff were living in the city of Poona and making short visits to Rahuri each week. He himself moved to Rahuri, took up residence in a temporary two-room building and set up his office in a tin hut.

Maharashtra was badly hit by the drought of 1972 and, shortly after the new Vice-Chancellor's arrival, MPKV launched a massive fodder production programme organised on a war-time basis. A fleet of trucks, tractors and field equipment was purchased and labourers and university staff worked day and night in the fields levelling ground. They also constructed a network of irrigation channels from the canal and installed water lifts. During this year 10,000 tonnes of green fodder were produced and supplied to farmers, saving

the lives of large numbers of cattle and other stock.

In the words of Dr Pawar, 'Although the drought disappeared, the equipment and the workers stayed and continued with the programme of clearing and levelling the campus area.' Modern buildings were erected and residential quarters for the university staff, who were now required to live at Rahuri. MPKV became a post-graduate university, with classes in all branches of agriculture and agricultural engineering. 2,000 workers from the surrounding villages found employment on the campus.

By 1976 Rahuri was well established with classrooms, laboratories, glass houses and administrative offices. The hills were dotted with trees and the campus had all modern conveniences. Plot after plot of land was levelled and irrigation extended from 150 hectares (393 acres) to 880 hectares (2,174 acres).

One interesting activity was the holding of Dignity of Labour Camps to inspire students with the dignity of labour by participating in practical work. This work included carrying out measures for water and land conservation, compost making and planting fodder and fruit trees. Hundreds of students from colleges and high schools took part in these Dignity of Labour Camps. During three months in 1974, 3,383 students days were utilised as part of this work.

The achievements of these students make impressive reading: construction of 5 ponds for the conservation of water for irrigation; digging and filling 320 compost pits; digging holes 2 foot square on marginal and submarginal lands, filling the holes with compost and manure and planting out some 50,000 trees; picking up stones from an area of 32 hectares (79 acres) and putting them into contour trenches.

In Asia the ambition of agricultural students is usually to get a desk job. At Rahuri, everything was done to instill into the students a love of the land and, through this, a willingness to go back to farming when qualified. With this in mind the university started a programme of allotting 1 hectare of land to each batch of 10 students. The students did all the operations on the land themselves from ploughing to threshing and

winnowing, under the guidance of their professors. The university provided the students with the necessary inputs. In the vocational schools attached to the university the students manage the farm, the dairy and the poultry units themselves. They are paid for the work so that they earn while they learn and learn while they work.

In 1977 the university at Rahuri had 140 students taking post-graduate courses in various branches of agriculture and 80 students taking a four-year course in agricultural engineering. An instructional farm of 400 hectares (998 acres) had been established at the central campus, on which land and facilities were allotted to each department.

The land at Rahuri varies from bare rock and shallow soils to deep and very deep black soils, thus offering valuable facilities for undertaking research on soils and crops. Crop research is concentrated on crops grown in that part of the state, or new crops likely to be of value in the district. As Maharashtra is a rice growing state, experimental work has been carried out on new, high yielding varieties of rice. One new variety of rice recommended for general cultivation in the district gave an average yield of 3,300 kilograms to the hectare, compared with the Indian average of 1,000 kilograms.

In conjunction with district officers, the university undertook the task of boosting rice yields on 800 hectares (1,976 acres) of small farmers' fields, in a programme known as 'Operation Rice'. The programme was a great success, yields obtained by the farmers ranging upwards from 3,000 kilograms to the hectare. The highest yield of 12,000 kilograms to the hectare was obtained by a farmer in a village in Kolhapur district. Operation Rice was implemented by pooling staff from various colleges to work with the district extension officers and the farmers concerned. Seeds, fertilisers and pesticides were available to the farmers and close technical guidance given. Operation Rice demonstrated in a practical way the capacity of the farmers to increase production once the necessary inputs and technical advice were available.

New strains of wheat have been evolved at MPKV suitable for both irrigated and rain fed areas. Strains of wheat have

been developed which have yielded up to 4,000 kilograms per hectare on irrigated land, compared with the average yield of 1,000 to 1,200 kilograms per hectare usually obtained in that part of Maharashtra. Similar developments have taken place in regard to sorghum, maize and other crops.

During a visit to Rahuri I was interested to see experiments being carried out with cotton plants, aimed at producing early maturing cotton with a better staple length. A new hybrid strain, which showed promise of being superior to strains normally grown in Maharashtra, was being tried out in 80 different locations in the state.

Taking advantage of the dry, bare hills of the campus, research has been carried out on fruit crops dependent on limited rainfall. As a result, information and experience is now available that can help in the development of many barren hilly areas of the state. Fruit trees have been planted at Rahuri over an area of 100 hectares (247 acres). The trees planted included pomegranates and mangoes by veneer grafting. The Vice-Chancellor told me that they had sold the crop of pomegranates, grown on an area of 6 hectares (15 acres) for over Rs 100,000 (US$ 12,500). For fruit trees, watering by the drip and ooze-out method was in use to make the most of available water.

In 1971 work started on a cow improvement programme aimed at evolving a breed of dairy cattle with a minimum milk production of 2,000 litres per lactation and a herd average of over 3,000 litres in 300 days. 375 Indian cows, mostly the local Gir breed, were used as foundation stock. Under the cross-breeding programme Holstein Friesian and Jersey bulls were used for crossing with these cows, and Brown Swiss bulls are being used for crossing with the cross-bred heifers. The first cross heifers have grown much faster than the Gir cows and have matured much earlier; an important factor in assessing their economic potential. Yields obtained in these trials have been given in the previous chapter.

One unusual sight in the modern milking shed was to see one high yielding cow being milked by two men at the same time. One squatted on each side of the cow, each using his own

bucket and milking the two teats on his side; the cow seemed quite unconcerned at this high speed method of delivery.

The university maintains close links with the farmers in the surrounding districts, and seeds of hybrid, high yielding varieties of different food, forage crops and vegetables are supplied to the farmers; seedlings, grafts and saplings of fruit trees are also supplied. An indication of the extent of this important service is the fact that seeds supplied to farmers over a four year period were valued at Rs 2,635,378 (US$ 329,400).

The transformation that has taken place in this vast campus at Rahuri in a brief period of five years is outstanding. All forms of agricultural and allied activities, from fish culture to goat breeding, are given close attention by staff and students. Local goats are crossed with the Angora breed to produce superior meat, milk and mohair. MPKV is an example of practical achievements resulting from the wise use of modern science and technology, together with sound leadership and hard work.

At one stage the development programme was held up by lack of funds. The Vice-Chancellor borrowed money from the bank, grew 160 hectares (400 acres) of sugar cane on the newly developed land and paid back the loan from the proceeds of its sale. Extensive trials with sugar cane at Rahuri have resulted in the development of a new variety of cane giving better yields. Following these trials, changes were made in the composition of fertilisers used, resulting in economies without loss of yield. Sugar cane occupies an important position in the agricultural economy of Maharashtra, and in 1974—75 over 5 million sugar cane setts were supplied to farmers.

Achievements such as those of the National Dairy Development Board in the field of dairying and of Mahatma Phule Krishi Vidyapeeth, in the field of agricultural research and development, are laying the foundation for increased food production in India.

12

AVAILABILITY OF MILK PROTEIN

This chapter and the two following ones are concerned with the use of milk to meet protein needs in the Third World, particularly the needs of infants for whom milk is the best form of protein.

Various estimates have been made of the need for edible protein. One estimate gives the demand in the Third World, for direct human consumption, as 53 million tonnes, with an increase to 97 million tonnes by 1990.

The Dutch Dairy Federation consider that, from a purely nutritional point of view, the requirements of milk protein are almost unlimited. In 1973 they stated:

> If only about 500 million under-nourished people in the developing world were to get a daily ration of 10 grammes of milk protein, this would require some 5.5 million tonnes of skim milk powder annually and would represent twice the total world output of skim milk powder in 1973.[1]

In 1970 the Indicative World Plan for Agricultural Development (IWP), prepared by the FAO, forecast that the nutritional gap relative to demand would amount to 30 calories and 2 grammes of animal protein per person in 1975 and widen to 80 calories and 4 grammes of animal protein in 1985. The report continued:

> While this seems trivial in individual terms, in the aggregate the deficit would amount to 3.6 million tonnes of protein in 1985. This is more than the total animal protein consumed in 1962 by the 6 EEC countries.[2]

Milk is often referred to as the perfect food. It contains fat, protein, sugar and inorganic salts as well as minerals and vitamins; the protein is of high nutritional value having all the essential amino acids. A leading nutritionist maintained that if all people in the Third World could be assured of having one

quarter litre of milk every day, the whole pattern of disease in those countries would be changed.

The Government of India undertakes a supplementary feeding programme and aims to reach 26 million needy people with 400 calories and 15 grammes of protein daily. If this were to be supplied in the form of double toned milk, it would require approximately 23 million litres a day, which would be equivalent to over 800,000 tonnes of skim milk powder a year — a quite impossible quantity of skim milk powder for India to produce or to purchase from overseas sources for the present.

This is a situation in which aid funded milk powder from the West would bridge the gap and answer infant malnutrition, until either milk or alternative forms of protein are available in India.

The Government of India is producing low cost, protein-like substitutes and other low cost foods for supplementary feeding. However there seems no likelihood of there being sufficient of these supplementary foods to meet the overall need in the near future.

In other developing countries considerable attention has been given in recent years to the development of suitable mixtures of plant proteins to provide a satisfactory source of supplementary food.

In Guatemala research on the development of vegetable-protein foods was pioneered by the Institute of Nutrition for Central America and Panama (INCAP). They produced a mixture based on maize and cotton seed flour called 'Incaparina'. Many other new protein-rich foods have been developed in co-operation with WHO, UNICEF and FAO. Few have however achieved any significant distribution. One exception is the GSM mixture (corn, soy and milk powder) distributed by the US AID through voluntary agencies in over 90 developing countries.[3]

One other source of protein which should be mentioned is single cell protein produced from the paraffin series of hydrocarbons. Yeasts grown on alkanes have a high nutritional value and have been proved safe for animal feed. The increasing price of oil makes the production of this form of

protein a doubtful commercial proposition. Moreover, at the present level of research and development, it will be a long time before manufactured proteins, whether from oil or other sources, can become a major source of protein.

Apart from problems of manufacture and the supply of raw materials, consumers are extremely conservative in the matter of foods. Milk is acceptable and needs no introduction and so remains the best form of protein for meeting human needs.

Many dairying countries are taking action to reduce the production of milk. Some economists maintain that milk is too expensive a form of protein to produce for use in aid programmes, yet millions of tonnes of milk powder is being fed to animals at highly subsidised prices.

Australia and New Zealand are the two major producers of relatively low priced milk, as cows can be kept out of doors all the year round, and on their rich pastures milk can be produced more economically than in other countries. The cost of producing milk in Australia is only half the cost of producing milk in India under the village co-operative milk schemes.

The United Kingdom used to be the main market for dairy products from Australia and New Zealand. With Britain's entry into the EEC Australia lost this market, while arrangements were made for New Zealand to continue to supply a reduced amount of dairy products. In order to discourage production in Australia, the government removed the subsidy on milk and adopted a policy aimed at reducing cow numbers by 20 per cent. As a result production has fallen.

In New Zealand the policy of the government is to maintain an efficient dairy industry capable of competing on overseas markets, as this industry has an important role in the economy of the country. With this in view the government has guaranteed a minimum price to New Zealand milk producers for the 1978-79 season and will grant direct subsidies if returns do not reach the agreed level.

Both countries should be interested in an arrangement to utilise milk powder as a bridging operation to counter malnutrition in developing countries for a period of 10 to 20

years. These countries, with large herds of cows and highly mechanised operations requiring the minimum of labour, are in an excellent position to meet any long term demands for milk at relatively low prices, but any action to increase the supply of milk must be on a long term basis. Breeding for increased production is a slow and expensive process and an assured market for the additional milk is essential.

In Canada steps have been taken by the Government to stabilise dairy surpluses on the national market by applying individual delivery quotas to milk producers. Production in Canada during the first half of 1977 dropped by 5.5 per cent. Prices to producers have fallen by 20 per cent and many dairy farmers have had to give up milk production. In the United States production is likely to continue the present slow upwards trend.

Milk production in the EEC, the world's biggest producer, is expected to continue to increase by about 0.8 per cent a year. It was hoped that the policy of reducing cow numbers in the EEC by 1—1.5 million would result in a drop in production. Past experience has shown that one effect of such cow reduction schemes is an increase in average yields as farmers take the opportunity of getting rid of their poor producers. Increased production of milk in Europe results mainly from the agricultural support policy. In 1976 support for milk products represented 37 per cent of the total expenditure on agricultural guarantees and almost 25 per cent of the whole EEC budget.

Increased milk production in the EEC has resulted in the notorious skim milk powder and butter 'mountains'. By 1975—76 skim milk powder stocks reached a record level of over 2 million tonnes. Even the United Kingdom, the world's biggest dairy product importer until the early '70s, is projected to have a small net export of dairy products by 1985. In order to halt the expansion of milk powder stocks, liquid and dry skim milk has been disposed of in Europe by being fed to animals. These disposals have risen to over 2 million tonnes of milk powder-equivalent a year. In 1978 some 1.8 million tonnes of skim milk powder, equal to 90 per cent of the year's production, plus liquid skim milk at an equivalent of over 0.3

million tonnes of skim milk powder, were disposed of in this way. This was done by applying subsidies varying from about 40 per cent to over 80 per cent. If these subsidies were removed a large part of this skim milk would be replaced with cheaper animal feeds.

In India in December 1974, Dr A.H. Boerma, then Director General of the FAO, addressed the International Dairy Congress meeting in New Delhi. He spoke of dairy development as vital in helping to produce stronger, fitter and better educated new generations able to contribute more effectively to the economic and social development of their societies.

He said, 'At a time when the world's poorer nations are facing a growing food deficit, it is hard to justify the fact that in Western Europe skim milk powder and liquid skim milk, at an equivalent of over 1.5 million tonnes of skim milk powder, should be fed to livestock at highly subsidised prices, when this amount represents three times the annual imports of milk powder into developing countries.[4]

The 1.5 million tonnes of skim milk powder he spoke of would be sufficient to provide a daily supplementary feed of 200 grammes (one fifth of a litre) of liquid skim milk to 200 million children suffering from malnutrition. And since he spoke, in 1974, the amount of skim milk powder used for stock feed has increased.

The EEC itself recommended in 1977 that 7.5 million school children in Europe should receive a quarter litre of milk a day. In commenting on this the Tetra Pak House Journal states:

> Studies by nutritionists and doctors show that a consistent intake of school milk produces a clear difference in the intellectual performance and physical activity of the child. Milk is the most all round natural food. A quarter litre of milk gives about 25 per cent of the daily requirement of calcium and riboflavin (Vitamin B2) and 20 per cent of the daily requirement of protein.[5]

If milk means so much to the children of Europe, the majority of whom are well nourished, what would it mean to the children of the Third World?

In 1977 Sir Richard Trehane, then Chairman of the Milk Marketing Board of England and Wales, referred to the EEC's failure to meet the needs of developing countries and said:

> In dairying there has been so much discussion of surpluses during the last two years that it has surely been overlooked that the growth of world milk supplies during this decade has fallen behind the growth in population. Taking one year with another, there has been an increase in milk supplies of only about 1.5 per cent a year. The developing countries have rightly put considerable emphasis on the expansion of their own dairy sectors; this is paying off, for as a group they have kept production moving in line with population. Even so, their consumption of milk solids is miserably low.
>
> Thus we are confronted by the extreme paradox of the developed countries, including such major producers as the EEC, Australia, Canada, seeking to reduce milk supplies while so much of the world's population is unable to secure an adequate supply of milk solids.
>
> Despite the accumulation of stocks of skim milk powder, approaching 2 million tonnes, food aid supplies in each of the last two years have not been much more than 100,000 tonnes. The FAO, following a detailed investigation in 36 of the poorer countries of the world, concluded that the developing countries could readily use 300,000 tonnes of skim milk powder a year as food aid, while 700,000 tonnes a year would be required if the recipients of this aid were to be supplied with the desirable intake level.
>
> Despite this overwhelming evidence not only of the needs of developing nations, but also of their ability to make full use of such aid, the inter-governmental committee has been unable to accept a proposal for a minimum target for food aid supplies of skim milk powder of 250,000 tonnes for each of the next three years.
>
> Even though we in the developed countries have had a difficult time in the last three years as a result of depression and inflation, surely we are not so badly impoverished

> that we cannot finance the food aid required to sustain some of the world's poorest people, at the minimum level of nutrition.[6]

(The value of 250,000 tonnes of skim milk powder at the minimum export price of US$ 425 per tonne is US$ 106.25 million.)

According to the FAO report, the 36 countries referred to by Sir Richard Trehane contained 342 million under-nourished people — 25 per cent of their population. Of these only 48 million or 14 per cent, mainly mothers and children, were included in a special feeding scheme and even these were only receiving an average of 0.7 kilograms a year, or 20 grammes of skim milk a day, a totally inadequate amount. This was because the use of dairy food aid was limited by shortage and irregularity of supplies, lack of proper facilities and trained personnel and lack of proper treatment of the skim milk.[7]

The FAO survey went on to say that these people should have received 11 times as much. Had they done so they would have consumed 370,000 tonnes of milk powder a year. Had the scheme been expanded to provide for 70 million people, still only 20 per cent of the people in need, the amount of milk powder required a year would have been 539,000 tonnes. In addition, in these countries, the use of milk powder in food for work projects could be increased from 8,000 tonnes in 1972-75 to 68,000 tonnes within five years, if sufficient supplies were available on an assured basis.

Irregularity in the supply of milk powder undercuts the effectiveness of such schemes. A recent issue of *Ceres* commented,

> For many years developed countries have made milk products available as food aid to the developing nations. However, not only have food aid quantities been small in relation to the surpluses of the rich countries, but they have also undergone sharp fluctuations.
>
> From an annual average of 270,000 tonnes in the first half of the 1960s, skim milk powder donations fell below 200,000 tonnes in the late 1960s and early 1970s and to as little as 76,500 tonnes on average during 1973-4. They

rose again to 121,500 tonnes in 1975, to 150,000 tonnes in 1976, and further increased to 225,000 tonnes in 1977.[8]

It has now been accepted by a number of donor countries, including the EEC, that food aid commitments be made three years in advance. While this is an improvement on the earlier year by year basis of allocation, it is still too short a period to encourage sound, properly planned and implemented projects. No commercial concern in the West would consider going into a developing country and investing considerable sums of money and technical know-how on a new manufacturing project, if the supply of raw materials on which the project depended was only assured for three years.

A guaranteed regular supply of milk powder and butter oil for ten years would allow for proper planning and implementation of projects; would ensure that maximum value was gained especially in the case of supplementary feeding of children; and would allow for the proper scheduling of production on farms and in dairy factories.

One argument frequently used against increasing the supply of aid funded skim milk powder to developing countries is that this will discourage local production. This does happen especially when irregular supplies are made available on a short term basis. If dairying countries are prepared to co-operate with Third World countries in working out integrated long term programmes, this will help in the development of local milk production as well as meeting immediate nutritional needs.

In the following two chapters ways will be considered in which the Third World can use skim milk powder in conjunction with the development of their own dairy industries.

NOTES

1 *Possible Requirements of Milk Products as Food Aid,* Dutch Diary Federation, mimeograph, 2 November 1973.
2 *A Strategy for Plenty,* FAO, Rome, Italy, 1970.
3 Bo Wickström, Marketing of Protein-rich Foods, *Nutrition,* Edited by Bo Vahlquist, the Dag Hammarskjöld Foundation, Sweden, 1972, pp. 97-111.
4 *Proceedings of International Dairy Congress,* Volume II, New Delhi, India, p. 141.
5 Tetra Pak International AB, House Journal No. 46, Lund, Sweden, p. 3.
6 Sir Richard Trehane, Address to Milk Marketing Board, mimeographed, Thames Ditton, England, 1977.
7 Committee on Food Aid Policies and Programmes, FAO, Rome, Italy, April 1977, p. 10.
8 More Milk Products as Food Aid, *Ceres* Vol. 10, No. 3, May/June 1977, p. 7.

13

MILK IN THE THIRD WORLD

Most countries in the Third World are in tropical or subtropical regions with little natural grassland and limited facilities for milk production. Also ambient temperatures are high and it is difficult to keep and transport milk without some form of heat treatment such as pasteurisation.

In the process of pasteurisation milk is heated to 62°C and held at that temperature for 30 minutes or to 72°C for 15 seconds. The milk is then cooled rapidly to below 4°C. This heat treatment destroys all pathogenic micro-organisms harmful to man as well as the major organisms that cause souring of milk.

In Europe the process of pasteurisation was developed initially as a means of keeping milk fresh during transportation to towns and cities and during distribution. Only later was pasteurisation recognised as an important means of preventing the spread of milk-borne disease.

A form of milk of growing importance in developing countries is aseptic or 'Long Life' milk. Aseptic, Ultra-High Temperature (UHT) milk has been sterilised at a high temperature for a short time (130° to 150°C for 2 seconds). It is then filled into non-returnable sterile cartons under sterile conditions. The UHT process avoids the flavour change associated with milk sterilised in the bottle or can. Aseptic milk will keep for 4 to 6 months without refrigeration and is widely marketed in Europe. It can be manufactured from locally produced milk, recombined milk or a mixture of both.

The production of aseptic milk in developing countries has been limited by the relatively high cost of this product, due mainly to the cost of special laminated paper used for making the cartons. Not only is this paper expensive but it must normally be imported, creating a continuing demand for foreign exchange.

A type of paper, known as Duplex paper, has now been developed by Tetra Pak for cartons for aseptic milk; this paper can be made from local materials in a developing country. It is much cheaper and has already proved satisfactory in use. Aseptic milk filled into cartons made with Duplex paper can only be kept for 2 to 3 weeks. However, where the milk is processed and marketed in the country of use this period is quite adequate. The ability to distribute aseptic milk without the need for refrigeration is a great advantage in Third World countries.

Buildings and equipment for the heat treatment of milk and for the manufacture of milk products are today highly specialised and costly. So, to establish a milk factory, it is necessary to have a sufficient volume of milk to justify the capital expenditure involved.

Until recent times milk production, other than for home consumption, has been confined largely to the temperate zones. Industrialisation in the West facilitated the development of modern machinery for the processing of milk and milk products. Today, 68 per cent of the world's population lives in the Third World, where only 22 per cent of the world's milk is produced. Of the 78 per cent produced in developed countries 3 to 4 per cent finds its way to the Third World as milk products. This includes both commercial sales and milk products supplied under aid programmes. Efforts have been made to encourage milk production in developing countries, but only in a few has increasing production kept pace with population growth.

Developing countries like India, with 20 per cent of the world's cattle, are in a unique position having the basic stock of cattle whose milk production can be improved by better feeding and management. Also, with cross-breeding, the production of an indigenous cow can be increased by 300 per cent in one generation.

Cows only breed slowly, a cow will start milking when 2 years old. A buffalo does not usually come into milk before 3 years of age and a cow or buffalo only calves once a year. Recombined milk can be used initially to provide the volume needed to

operate a milk factory on a viable basis. Locally produced milk can be mixed with the recombined milk and as the quantity of local milk increases the amount of recombined milk can be reduced. For making recombined or reconstituted milk, skim milk powder is dissolved in water, and butter fat, or in some countries vegetable fat, is added to this solution. The mixture is pasteurised, homogenised and cooled and can then be used in the same way as fresh milk. During the process of homogenisation the milk is submitted to high pressure to break up the fat globules and prevent the separation of the fat.

Skim milk powder and butter oil can be transported from one country to another, stored, and recombined into dairy products where it is to be consumed. Unfortunately, because of the high cost of skim milk powder and butter oil on world markets, milk produced by this process is relatively expensive in a poor country. This has limited the ability of governments to use recombining as the catalyst in developing local milk production.

Skim milk powder is produced in dairying countries from skim milk left when the cream has been removed, usually for the manufacture of butter. Skim milk powder can be kept in storage, under normal conditions, for at least a year, without deterioration or flavour change. Full cream milk powder is packed in airtight containers in which the air has been replaced with an inert gas. The high cost of packaging in this way makes full cream powder too expensive to use in recombining operations. Also, importing skim milk powder and butter oil separately for recombining makes it possible to vary the percentage of fat in the finished product at the time of mixing, according to market needs.

A new process for the manufacture of full cream milk powder has been developed in Sweden. The manufacturers claim that this powder can be stored under normal conditions, without gas packing, for up to a year, without deterioration in flavour. This new product is at present being submitted to long term storage tests. If these prove satisfactory it will no longer be necessary to ship skim milk powder and butter oil separately and the high cost of storing butter oil under refrigeration in

hot climates would be avoided. This milk powder could be used to advantage for making recombined milk, especially on a small scale, for supplementary child feeding. The need to store butter oil would be avoided and the process of recombining would be relatively simple. The possibility of manufacturing small automatic mixing and processing units for use with this powder is under study in Sweden.

Butter oil, which is 99.9 per cent pure butter fat, is normally manufactured commercially directly from cream and is filled into 18 litre cans or 200 litre drums.

Buffalo milk, which at present predominates over cows' milk in some countries, has a high fat content, usually over 7.0 per cent, compared with cows' milk in which the average fat content is 3.5 per cent. As nutritional needs are usually for protein rather than fat, skim milk can be added to buffalo milk to give a product with less fat but the same amount of protein. Milk prepared in this way is known as toned milk.

In making skim milk the percentage of protein in the final product can be increased by increasing the amount of skim milk powder added. If, for example, 100 litres of skim milk are added to 100 litres of buffalo milk with 7 per cent fat, this will make 200 litres of milk with 3.5 per cent fat and the normal non-fat-solids content of about 8.5 per cent including 3.3 per cent of protein. Adding an additional 5 kilograms of skim milk powder will give a non-fat-solids content of 11.0 per cent with 4.3 per cent of protein. It is the normal practice to increase the amount of protein in toned milk in this way.

Toned milk, in the early stages of the Bombay Milk Scheme, had an important role in increasing the total quantity of milk available at a time when milk was in short supply. When buffalo milk with 7 per cent fat was selling for Rs 1.70 (US$ 0.20) a litre, toned milk with 3.5 per cent fat was selling for Rs 1.20 (US$ 0.14) a litre, and double toned milk with 1.5 per cent fat for Rs 0.65 (US$ 0.07) a litre.

The ability to produce a protein-rich toned or double toned milk, to sell at a lower price than normal milk, makes a valuable contribution to nutrition in countries where milk is in short supply and relatively high in price.

Recombined milk can be used to extend supplies of whole milk during a period of low production. With the use of modern technology most dairy products can be manufactured by the recombining process, including butter.

Mention has been made earlier of the production of recombined sweetened condensed milk in South East Asia. Both recombined sweetened condensed milk and recombined evaporated milk are now manufactured extensively in Third World countries, utilising imported skim milk powder and butter oil and mixed with locally produced fresh milk if it is available. These manufacturing operations have been developed, within the framework of import substitution, to replace sweetened condensed and evaporated milk previously imported from dairying countries. A survey carried out in 1972 indicated that there are some 30 fully equipped recombining factories in South East Asia and also a number in other regions of the Third World, especially in South America.[1]

In many recombining operations there is a definite policy of encouraging the production of local milk and including it in the recombined product. Where there is very little local milk production, commercial recombining operations based on the import of skim milk powder and butter oil can operate against its further development. This is especially the case if the object is to provide a market for milk powder from overseas.

It has been reported that in one country of South East Asia the development of local milk production was the basis of a recombining operation. The operation concerned started off with 95 per cent of the milk made from imported milk powder and butter oil, the balance being locally produced milk. By 1974 the proportion was in the order of 60 to 66 per cent milk produced locally.[2]

There is undoubtedly a considerable unutilised capacity in existing recombining factories in developing countries, as indicated by the statement of Sir Richard Trehane, quoted in the previous chapter. Once a country has a dairy industry in operation, with experienced staff, expanding buildings and machinery to handle additional throughput should not be difficult.

Skim milk powder has an important role in developing countries in preventing blindness. Xerophthalmia, caused by Vitamin A deficiency, blinds an estimated 300,000 people every year. It is especially severe in a number of countries of Asia, where it is one of the main causes of blindness in children. One of the most satisfactory methods of preventing the incidence of blindness is to supply a developing country with skim milk powder fortified with Vitamin A. For some years the US Government has arranged for all milk powder supplied as food aid to be fortified in this way; this is not yet the case with milk powder donated by European countries. The World Health Organisation (WHO) now strongly recommends that all milk powder distributed under food aid programmes be enriched with appropriate amounts of Vitamin A. It is also important that mothers of child-bearing age in developing countries, who are likely to have inadequate reserves of Vitamin A, should receive fortified milk. This also allows a breast fed infant to build up its own reserves of Vitamin A from its mother's milk after birth.

According to the WHO the risk of xerophthalmia-induced blindness is not a trifling issue. In India alone 10,000 to 12,000 people (mostly children) go blind every year solely due to xerophthalmia. The generally agreed estimate of 30,000 people blinded in the world by xerophthalmia every year should be seen in perspective. For every blind xerophthalmia case, about two more get away with either retaining one eye, or with corneal scars through which sight is seriously impaired. Other products such as sugar and tea can be enriched to supply the needed Vitamin A, but vitamin enrichment can be carried out cheaply and conveniently in the manufacture of milk powder.[3]

It is also the recommended practice to add Vitamins A, D and B during the recombining process in developing countries. Research work carried out in Australia on recombined dairy products has indicated that losses of vitamins during processing are very low.

It is sometimes suggested that people in Asia cannot take milk because it upsets their digestion or, in nutritional terms,

they have a lactose intolerance. It is true that people who are not used to drinking milk will often be upset when given milk every day. Evidence from India is that the number of such people is limited and, with the majority, any digestive problem does not last for more than a few days.

In the early '70s there was so much talk, in the West, of lactose intolerance in Asian people that this was used as a reason for not sending skim milk powder to Asia as food aid. The Protein Advisory Group of the United Nations found it necessary to issue a statement on this subject. They expressed the opinion that while there was occasional evidence of lactose intolerance, the importance of milk as a source of protein in developing countries outweighed any digestive difficulties that might be experienced. The Group recommended that supplies of milk powder should not be withheld from developing countries on this account.

NOTES

1 F.G. Kieseker, Reconstitution and Recombination of Conserved Products for extending milk supply for liquid consumption, *Proceedings of International Dairy Congress,* Vol. II, New Delhi, India, pp. 466-472.

2 F.G. Kieseker.

3 Enrichment of Dried Skim Milk, *Food and Nutrition,* Vol. 3, No. 1, FAO Rome, Italy, 1977, p. 4. Note: In *Food and Nutrition* Vol. 3, No. 3 the following statement appeared: Revised estimate of xerophthalmia victims — 'In the article on Enrichment of Dried Skim Milk in *Food and Nutrition,* Vol. 3, No. 1, 1977, it was stated that xerophthalmia blinds an estimated 100,000 people yearly. This estimate has now been increased to 300,000.' I have accordingly used the higher figure.

14

MILK POWDER, AN ANSWER TO MALNUTRITION

There are several ways in which aid funded skim milk powder and butter oil can be utilised by developing countries to answer malnutrition, especially among children.

Where a country has existing recombined milk factories with surplus capacity, this can be used for the production of milk from aid funded imported milk powder. The cost of recombining and handling charges to be met by the local government at an agreed rate. In a country with no existing recombining factories or where there is no surplus capacity plans would include the erection of the necessary factory and the provision of equipment and services.

One approach is to establish factories equipped to fill quarter litre and half litre cartons of recombined aseptic milk. The quarter litre cartons to be used for free supplementary feeding programmes for children and pregnant and nursing mothers. The half litre cartons to be sold at a price which would cover the cost of recombining and handling both the quarter and half litre size. Thus the sale of half litre cartons of milk would pay for the entire operation, apart from the cost of the milk powder and butter oil.

It has been estimated that, in a typical milk factory, if half the milk is given away free of charge, the cost of the half sold would be around US$ 0.05 a half litre. This is based on a turnover of 22,500 litres a day in quarter litre cartons to be distributed free and 22,500 litres in half litre cartons to be sold. This does not include distribution costs and assumes that milk would be from free milk powder and butter oil supplied under aid programmes. Where there is a demand for milk at normal prices it would be reasonable for the country concerned to purchase commercial supplies of milk powder and butter oil and produce this recombined milk in the same installation.

To ensure the development of local milk production, it would be essential to provide all necessary services to farmers. These would include twice a day collection of milk from collection depots located within reasonable distance of the farms. It would also be necessary to provide for the supply of concentrated feed for cattle and a satisfactory veterinary and artificial insemination (AI) service if these were not already in existence. As has been pointed out in the chapter on 'India's White Revolution' these services are best provided on a producer co-operative basis.

In countries where there are at present few cows, it will be important to develop cow keeping to take advantage of the market for milk. The dairying countries of the West could make a major contribution by supplying cattle to Third World countries.

Contribution has already been made by voluntary organisations, like 'For those who have less' in Australia, in sending large numbers of milking and breeding cattle to nearby countries. But to build up a dairy industry in a country like Indonesia, where there are few milking animals, calls for a major operation on a government to government basis.

Given help Indonesia, with the fifth largest population in the world, could produce all the milk they need, especially in the less populated islands. It would require an integrated programme for the supply of cattle from dairying countries and the production of green feed and concentrates in Indonesia. The Dutch successfully established small herds of Friesian cows in Java. Cows should if possible be kept in conjunction with present farming operations, rather than by setting up large herds.

Such a project could be organised on a producer co-operative basis on the lines of the Indian scheme. However, it will take many years to achieve self-sufficiency in milk production even with the help of dairying countries. Nevertheless, this would be an excellent project to be undertaken by the nearby countries of Australia and New Zealand. Recombining imported milk powder and butter oil would be an essential bridging operation to provide milk for a

distribution system which would also absorb locally produced milk. In the absence of a major scheme along these lines, Indonesia will continue to be dependent on imported milk powder and butter oil.

There are other countries in South East Asia and in other parts of the Third World with the same potential for cow keeping and milk production. The development of dairy farming in this way would provide a regular income to the small farmers and would make a major contribution to meeting the needs of the rural poor.

A Third World government embarking on a long term programme for dairy development will need to come to terms with commercial recombining companies. This could be on the basis of taking over the recombining factory at valuation. Alternatively if the recombining factory had spare capacity, an agreed rate per litre could be paid for the manufacture of recombined milk. Also arrangements could be made for the commercial operation to buy all available locally produced milk at a price equal to the cost of milk manufactured from imported milk powder and butter oil. Any additional price paid to producers could be in the form of a government subsidy. The cost of providing milk collection depots and all services for the producers could be met either by the government or by forming producer co-operatives. It would be quite reasonable for the government to require dairy companies to purchase all available local milk.

Some commercial undertakings would undoubtedly be concerned at possible competition from free or low priced milk. However the children and pregnant and nursing mothers who would be supplied with free milk under a supplementary welfare scheme would not normally buy milk because of the relatively high price of milk in developing countries. In Britain, in 1976, it took three and a half minutes for an average wage earner to earn the price of half a litre of milk. The same figure for an industrial worker in India would be about 30 minutes. A fully employed rural worker in India would take 96 minutes to earn the price of half a litre of milk. People living below the poverty line do not buy milk. The main

outlet for sweetened condensed milk in South East Asia is through the coffee shops. These sales should not be affected by low priced or free milk to people in need.

Integrated dairy projects would need assistance with aid funds for the erection of processing dairies and milk collection facilities. A typical recombining dairy, with a capacity of 45,000 litres a day and equipped for the production of aseptic milk in quarter and half litre cartons, would require capital expenditure in the region of US$ 1 million. This would not include the cost of land or collection and delivery services.

One international organisation which has been set up to co-ordinate the type of development being considered is the International Scheme of the FAO for the Co-ordination of Dairy Development. This scheme was referred to by Dr Boerma in his address to the International Dairy Congress in New Delhi, where he said:

> This scheme which was approved by FAO's governing bodies in 1970, involves assistance in planning of dairy development programmes and the co-ordination of aid at both national and international levels. In particular, it requires the integration of dairy development into the national economic and nutritional programmes of the developing countries concerned.
>
> One of the most encouraging features of the scheme has been the way in which, say, five or six countries agree to co-operate in assisting one recipient country. For example, one of the five may provide fertiliser for feed and pasture development. A second country, equipment for a veterinary laboratory or feed mill. A third one, assistance in setting up an artificial insemination scheme in co-operation with the International Bull Semen Donation Scheme. A fourth one, equipment for milk collecting and processing. A fifth one, help in establishing a training centre for extension workers. And so on.[1]

While dairying authorities in the West undoubtedly appreciate the need for long term planning for dairy development, it does seem difficult for governments in those countries to relate aid to dairy surpluses, on a long term basis. Also the

more generous countries, in terms of ODA, are not of necessity the countries with milk in excess of domestic requirements. The cost of donations of milk powder and butter oil to Third World countries should be met by the community as a whole and not only by the dairy industry.

Long term projections indicate that milk production in the EEC will continue to rise for the next 10 to 15 years. Under the circumstances the EEC may be prepared to enter into contracts for the supply of milk powder for a 10 year period. Also, as mentioned earlier, New Zealand needs to maintain a viable dairy industry and the production of milk could be increased considerably both in that country and in Australia. Both countries should be willing to enter into contracts for the supply of milk, on a 10 year basis, at favourable prices.

If the developed and developing countries decide to meet the protein needs of 200 million malnourished children, as well as others suffering from malnutrition, the demand for protein will be considerable. There seems no likelihood of milk or other forms of protein meeting this need in the foreseeable future. While the supply of milk powder as aid would be a bridging operation, it will be a long bridge.

Dr K.E. Beazley, former Minister of Education in the Australian government, recently drew attention to an important proposal for a new international fund for aid to developing countries. Dr Beazley was addressing the Royal Commonwealth Society in London when he spoke of a new type of Marshall Plan, operative for 20 years, which has been proposed by Sartaj Aziz of Pakistan, Deputy Director of the World Food Council. Dr Beazley said:

> Sartaj Aziz writes that the centre piece in the plan could be a new fund for basic human needs. It has been estimated that, by investing about US$ 10,000 million to US$ 12,000 million a year, the basic human needs of the poorest 30 per cent of mankind can be met within 20 to 25 years. This in turn will eliminate the worst aspects of world poverty before the end of this century ... New markets and higher levels of trade will be generated for both North and South.

Sartaj Aziz believes that this proposal could make common ground between and give common purpose to North and South, and something like his proposal, at least in its basic assumptions, seems to have been advocated recently by the present Australian Prime Minister, Mr Malcolm Fraser.

Where will the US$ 10,000 million to US$ 12,000 million of the Sartaj Aziz proposal be found? He (Sartaj Aziz) envisages an action in which all countries, developed and developing, will be invited to contribute a certain percentage of their GNP (possibly an average of 0.3 per cent) to the proposed 'World Fund for Basic Human Needs'. He has specific proposals for developed countries, developing countries, and oil producing countries, but 0.3 per cent of GNP in the world as an average would produce the US$ 12,000 million. He comments, 'If the current disarmament discussions succeed, even a five per cent reduction in arms expenditure could provide the funds.'

The proposal for meeting world basic needs would have many practical consequences if it were adopted. Abject poverty desperately needs protein, meat, cheese and other dairy products. The countries containing the abject poor need capital investment in technology — the technology of cold storage and food preservation, for instance. There cannot be a significant trade in fish, meat and butter without it. The world is actually chronically short of protein foods.

The type of fund envisaged by Sartaj Aziz would provide funds for the implementation of proposals for free milk for malnourished children and major irrigation for South Asia as outlined in Chapter 5. One basic human need is for food, and unless hunger is answered meeting other needs will be of little avail.

There is no technical reason why malnutrition should not be answered in the Third World by supplying skim milk powder and butter oil from the West under aid programmes as part of overall integrated development programmes. The West, by

making funds available for the purchase of these dairy raw materials, would be making a major contribution to their own dairy industries. The stigma of feeding milk protein to animals while millions of children starve would be removed.

NOTE

1 *Proceedings of XIX International Dairy Congress,* Vol. II, New Delhi, India, 1974 p. 143.

15

SUMMARY OF PROPOSALS

As the main purpose of this book is to draw attention to action that can be taken now to answer malnutrition in the children of the Third World, it is advisable to summarise the recommendations.

Milk for pregnant and nursing mothers and for young children is the only immediate and practical answer to malnutrition in the developing countries. Milk made from imported, aid funded milk powder and butter oil can be used as a bridging operation within the framework of the sound development of local milk production. Answering infant malnutrition is the essential first step in equipping the men and women of the future to meet the challenge of the twenty first century.

People living in poverty cannot afford to buy milk or other protein foods even if they are available. Therefore, for the present, milk must be provided free for poor nursing mothers and for infants at least up to the age of three years. To take no action until cheap protein foods are readily available, or until poor people have the money to buy milk, condemns the children of the Third World to hunger and suffering and possible death or the risk of limited mental and physical development.

A regular supply of milk will help to ensure proper brain development and will build up a resistance to disease. It will give children the start in life which every child deserves. Any supplementary feeding programme must be properly organised and supervised to ensure that the milk reaches those for whom it is intended.

For people of the West to take responsibility, with people in the developing countries, for answering malnutrition in children would be a sound progressive step in keeping with high moral and ethical standards. Failure to act, when the

means are available to answer malnutrition, shows a lack of compassion and must ultimately lead to a breakdown in international relations.

There is no technical difficulty in converting milk into milk powder and butter oil, transporting these products to any part of the world and recombining them to make milk or milk products. Nor is there any problem in adding fresh milk, in small or large quantities, to the recombined milk.

In countries of the Third World where cattle keeping is possible, the development of local milk production should be a component of any recombining project. So in order to finance the purchase of locally produced milk the project should also provide for the sale of milk.

To develop local milk production the project needs to provide for:

1 The crossing of local cows with high yielding overseas breeds to increase production, while retaining the disease resistant characteristics of the local cattle. In countries where there are few local cattle, as in South East Asia, plans need to provide for importing milking animals from overseas.

2 The growing of fodder for the cattle, particularly lucerne where irrigation is available, fodder trees and drought resistant legumes such as siratro.

3 The manufacture of concentrated cattle feed from ingredients available locally.

4 The provision of the necessary veterinary and artificial insemination services.

5 The erection and equipping of milk collection centres within reasonable distance of the farmers producing milk. The centres may need to be equipped for cooling the milk — depending on local conditions — and should if possible be operated on a producer co-operative basis.

6 To encourage milk production a farmer must be guaranteed a market for all the milk he wishes to sell, at a price related to the cost of production.

7 Plans should include a technical advisory service for the farmers and arrangements for the supply of seeds, fertiliser, etc on credit.

The milk project as a whole should be a joint undertaking between a developed country or group of countries in the West and a Third World country. Action would need to be taken along the following lines:

1 To request the help of the FAO in carrying out a detailed survey in co-operation with officers of the Third World country and preparation of a complete scheme and plan of action.
2 The donor countries to negotiate contracts for the supply of milk powder and butter oil either from their own resources or from a dairying country for an initial period of 10 years. These purchases to be financed from their own aid allocation or from a special international fund created for this purpose.
3 The World Bank to be asked to provide loan funds for the purchase of equipment for the collection centres and the recombining factory.
4 Land for buildings to be provided by the Third World country which would also be responsible for the erection of the necessary buildings.
5 For distribution, consideration to be given to the installation of vending machines of the type in use in India.
6 A Milk Commissioner and suitably qualified staff would need to be appointed. They would be assisted initially by advisers from the donor country.

In countries where recombining plants were already in operation — whether operated by the government or privately — an initial approach would be made to ascertain whether these plants had surplus capacity. If so, they would be supplied with the necessary quantity of milk powder and butter oil and be paid an agreed rate per litre for preparing the recombined milk.

16

ANSWERING MALNUTRITION — EVERYBODY'S RESPONSIBILITY

This book is intended to help ordinary men and women understand better the needs of the Third World. The means exist in the world to answer poverty and malnutrition, if people care enough to ensure that action is taken.

I have directed this book mainly to the developed nations. I have done so because the developed nations — the haves — are in a position to do a great deal to help people living in absolute poverty. Many people in the West, once they appreciate how little sacrifice is really needed to bring an answer, will surely insist that Western governments give more real help to Third World countries. I hope that the facts given in this book will be used by many people to prompt governments to act. As we find a motive and purpose beyond ourselves, our own problems and those of our nation will be seen in a new light.

But also in the developing countries there is a lack of compassion and concern for the needs of poor people. All too often there is an almost callous disregard of the malnutrition and hunger of children. In a country like India, the industrialised sector benefits from an improving standard of living with little apparent concern for the needs of the rural areas.

Today we live in a world where more than ever before we are interdependent and where we can no longer live as isolated individuals or nations. The best schemes are often thwarted by people with selfish motives. All too frequently the interests of people as a whole are sacrificed for the personal gain of those who use corrupt practices to achieve their own selfish ends.

But we also live in a world where we are conscious of the need to find a new way of doing things. A world which has created the United Nations and its Agencies which, in spite of many imperfections, is still an international organisation on

which to build. We have had a World Food Conference and the Lomé Convention. Dedicated men in many countries are giving leadership and are seeking the answer to poverty and division. If we match the aspirations of the New International Economic Order with change in our own way of life, it can well become a reality. Only with the sincere co-operation of every citizen will it be possible for this new Order to become an effective force in the world. As I am, so is my nation, is an inescapable truth.

Much is being achieved by the genuine dedicated work of voluntary agencies in the field and this work needs to continue. But an effective answer can only come at the level of government action. Many nations, like Sweden, have given sound leadership in their approach to the needs of developing countries; more of this type of leadership is needed and it must go further and wider. Will any nation in the West join hands with a developing nation, in carrying out a 10 year integrated programme of dairy development to end malnutrition?

One cannot escape the fact that the ultimate answer to poverty rests with the politicians in all countries. Once governments have accepted responsibility for meeting basic human needs, men and women, organisations and government departments can act within the framework of government policy. Then people in the West who are prepared to restrict their diet, or to eat less meat to help the Third World, will know that those who have real needs will benefit. Food will be produced and distributed not only to obtain the highest price but according to the needs of people. The North/South Dialogue would become a forum for decision if both sides were concerned to reach an agreement fair to all. I believe a more generous attitude on the part of the industrialised nations would bring a response from the Third World.

If we, as individuals, are genuinely concerned to see an answer to poverty and malnutrition, we will bring pressure on our governments to do what is right. The first step could be to insist that governments increase ODA to 1 per cent.

The need for an increase in ODA from the present average

of 0.33 per cent of the GNP to 1 per cent has already been mentioned. Half this increase would provide the fund for meeting basic human needs outlined by Sartaj Aziz. The need for this increase is of such vital importance that it is well to quote the words of the Commonwealth Experts Group:

> Lest it be said that the provision of net ODA to the amount of 1 per cent of the GNP would impose an intolerable burden, it is estimated that, for the developed market economy countries, (DAC countries) this would entail their devoting to an increase of ODA only some 5 per cent of the amount by which they may reasonably be expected to grow rich over the next decade. They would thus retain 95 per cent or more of the increase of their GNP for their own use and still increase net ODA to 1 per cent of GNP. Such an effort would be relatively negligible in relation to the prospective increase of wealth and income of the developed countries, and yet would substantially improve the situation in regard to the transfer of resources.[1]

In a democratic society we are all responsible, although we have the right to expect courageous leadership from our government. The measure of our care is the trouble taken to ensure that people elected to govern, act in the interest of all people. It is a delusion to think that as long as we are not actively doing wrong all is well. We are all prone to ' sit on the fence' and point the finger at the other fellow or nation. Perhaps we need to face the fact that if I am not part of the cure then I am part of the problem. In every country we need to have the moral authority born of the way we ourselves are living, to demand that our government acts on the basis of what is right in any given situation.

In the introduction I wrote of my decision, 45 years ago, to listen to God for direction that I might learn to have a part in building a just world. I know I could have done better in living out that commitment, but I am grateful for all the opportunities that life has brought. Living as I do in rural India I long to see people have a chance of a healthy life, free from want and suffering.

It concerns me that my country, Australia, does not use available resources to meet the needs of her own Third World, the people of the Aboriginal race. A Commission of Inquiry into poverty found that Aboriginals are the poorest, worst housed, least educated section of the community with the highest morbidity and mortality rates. Among Aboriginals in the Northern Territory of Australia the infant mortality rate in 1977 was 75 per 1,000, compared with a figure of less than 20 for whites. Aboriginal children in general show all the symptoms of protein deficiency and are almost exclusively sufferers from specific afflictions — tuberculosis, yaws, leprosy, trachoma and other diseases to which poor nutrition makes them susceptible. In many parts of Australia Aboriginal children, in common with children in the Third World, suffer the effects of calorie/protein deficiency before birth and during the early years of life; they are all too often condemned to a life of restricted mental and physical development. Even in the urban areas Aboriginal children suffer the evils of malnutrition and an inadequate diet.

It says little for our concern for the needs of children that this situation can exist in our country where we have ample food and all the resources to make food available where it is needed. This applies in particular to milk which could, if we wished, be given to pregnant mothers and infants in the early years of life. Dr Beazley, who wages a relentless battle on behalf of the Aboriginal people, has suggested that the Australian Government make Aboriginal child health a major objective. He writes, 'I am not suggesting that the Third World outside should be ignored. I am suggesting that a blue print can be developed within Australia, where we have complete command of resources, which can give direction to action in the Third World.'[2]

As I write, the question of cancellation of the debts of the poorer developing countries is under discussion. But some developing countries are not happy with debt cancellation. They feel that they will lose credit worthiness when they need further loans. There may be some cases where it would be more in the interest of both parties to reschedule existing debts to

provide for only a nominal rate of interest and a longer period for repayment.

Developing countries need to put their own house in order and to ensure that development is for all people and not only in the interest of a few politicians or one section of the community. Much can be done and needs to be done to deal with problems of unnecessary wastage of grain from vermin and mould in storage. In some countries 25 per cent of the grain harvested is spoilt before it reaches the point of consumption.

In this book I have of necessity given figures of the numbers of people living in poverty in the Third World, and of the many millions of children suffering from malnutrition. I believe we all find it difficult to visualise people in terms of hundreds of millions. But poverty becomes real to me as I walk down the rough track between the houses in a nearby Indian village.

This typical village has a population of some 800 people. The village has no electricity although the power lines are quite close and it has been at the top of the list for connection to the power supply for some years. The village well is at the bottom of the village which is built on the side of a hill. Because there is no electricity to run a pump, all the water has to be carried up the hillside by the women. There is a stream in a nearby valley but little has been done to make it available for irrigation. So only a few farmers whose land adjoins the stream can take advantage of the water for their crops.

One young farmer told me that he owned less than a hectare of land, divided into two plots in different parts of the village. This land which has no irrigation can only produce one crop a year; giving enough grain for his young family and himself for 6 months. The rest of the time he struggles to find work of some kind to make it possible for his family and himself to live.

The district this village is in does not yet have a milk producer co-operative society on the Anand pattern. So there is no guaranteed cash market for the milk of his buffalo. While the government offers a veterinary and artificial insemination service these lack the producer orientated organisation found

in the Anand schemes. And there is no feed mill. He cannot afford to own bullocks; in fact he told me that there are only 3 bullock carts in the village. It costs him Rs 30 (US$ 3.80) a day to get his land ploughed. Many versions of the same story can be heard in villages in many parts of the Third World. And the ones who suffer are the children — the men and women of the next generation.

Think of the needs of the children in the Third World, not as a charity to which we or our country should give money — although money is very necessary — but think of them as fellow humans who long to live and to be loved just as much as our own children. Only as we have the compassion to demand right action will governments act. Only then can all children have the chance of a happy healthy life in the future, rather than a life dominated by the griping pains of hunger, or a life that comes to an early end from lack of food.

Finally it is my belief that there is a God who cares deeply for each man, woman and child here on earth; a God who has given man freedom to choose whether he will do what is right and what is the will of God, or what is in his own interest without regard for the effect on other people. The world needs today men and women willing to learn to live on a moral and spiritual basis and to use aright the vast material wealth of this world. Only then will development be truly in the interest of people.

NOTES

1 *Towards a New International Economic Order,* pp. 89-90.
2 Kim Beazley, The Third World within Australia, *Development News Digest,* P.O. Box 1562, Canberra, ACT 2601, Australia, March 1978, pp. 8-9.

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