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SPEECH BY THE MINISTER FOR HEALTH, DR. TOH CHIN CHYE, AT THE INTERNATIONAL SYMPOSIUM ON SCIENCE AND TECHNOLOGY FOR DEVELOPMENT AT THE HYATT HOTEL ON MONDAY, JANUARY 22, 1979, AT 9.30 A.M.

We are living in an unequal world. The reasons are social and political but there are also reasons related to the historical development of technology. In the 15th and 16th centuries Italy and Germany were recognised as the technologically developed countries of Europe. It was the Age of the Renaissance with which Leonardo da Vinci was associated. Mills previously driven by human or animal manpower were being substituted with the water mill or windmill. They were the principal sources of power for pumping water, sawing, drilling, grinding grain and tobacco, operating hammers for crushing or the bellows of a furnance. Ideas on the use of steam were conceived but never bore fruition until James Watt invented his steam engine in 1969 and stimulated the First Industrial Revolution which covered 1750-1850.

Transportation, the utilization of power for mechanization, the transformation of raw materials, improvements in agriculture and the development of firearms were areas to which technological inventions contributed greatly. In the 20th century new industries have come to be built around new inventions. The acquisition of knowledge and the development of technology progressed at an accelerated space which has been so vividly described by Alvin Toffler in his book The Future Shock. The momentum for technological progress remained in the western countries so that their political and economic activities up to this day have been dominant in setting the pace for economic expansion or contraction for the rest of the world.

The first period of global economic expansion occurred roughly between 1895-1915 during which Watt's steam engine was displaced by the internal combustion engine and the diesel engine. Together with the innovation of mass assembly systems it led to the birth

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of the automobile industry and revolutionized overland transportation. The invention of valves made wireless telegraphy and radio broadcasting possible and together with the telephone telecommunications became an industry in its own right. Nitrogen was fixed from air for the first time by a chemical process and synthetic fertilizer stimulated agriculture.

The point that I have sought to make is that technological innovation and invention provide a tremendous impetus to economic growth. Yet the 20th century is also remembered for its years of the Great Depression in the 1930s which originated in the United States but its impact circumvented the world. A get-rich-quick philosophy spread like a viral infection and as many as 10 million people were drawn into speculation in the stock market by 1929 but the bubble had to burst. The fruits of technological progress had been converted into paper "wealth" which was expected to grow on itself without effort and without further expenditure in capital investment.

Even during the period of economic stagnation sound motion pictures appeared and pre-stressed concrete was invented. Sulphonamide and antibiotics were gains for the pharmaceutical industry. Although the Wright brothers demonstrated the first heavier-than-air vehicle to fly on its own engine power as early as 1903, piston-engine aircraft was only used in World War I but by the 1930s they were sufficiently developed for use by commercial airlines.

The period 1940-1970 witnessed an economic recovery and years of growth. I hesitate to speculate on the extent that the demands of World War II have to play. Certainly as combatants fought for supremacy in the skies considerable investment was made in aeronautics. The intention of the jet engine in 1940-42 was a revolutionary event. Although it was produced too late to be used in the battlefields, after the war the jet engine dominated every field of aviation, military and civil. The operating costs of the airlines were reduced as the jet engine could power larger and faster airplanes than can be built with piston engines. Air transportation took a big leap forward. The aerospace industry is an example of an industry which has a multiplier effect in generating new investment and

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creating more employment. Aircraft transportation generates demands for airports, instrument guidance and landing systems and engineering services. Military aircraft and missiles have created a gigantic industrial complex which even disarmament talks cannot dismantle because of its profound influence in politics and economics.

Commercial television broadcasting made its appearance. Micro-electronics has refined not only the telecommunications industry but also introduced into the market computers, electronic calculators and watches for every man. New materials in the form of polymers such as nylon and plastics gave a new dimension to the petrochemical industry.

Transportation, mechanization, the transformation of crude materials, the military industrial complex are profligate in their consumption of energy. Abundant and cheap oil has provided the means for the unprecedented industrial expansion in the 20th century. Oil is no longer cheap, a dramatic four-fold increase in the prices of oil in 1973 has raised questions on whether there are limits to growth. For some of the OPEC countries the increase in the price of oil has made the deserts bloom with universities and hospitals, airports, roads and housing, nuclear reactors and the most sophisticated military hardware. It was like rubbing Aladdin's lamp. While on the one hand the transfer of technology to oil-producing countries has been swift and overwhelming, on the other hand developing countries which were substituting mechanization for animal power in agriculture were caught short of foreign exchange. The buffaloes which traditionally and patiently ploughed the land had disappeared and machines without oil remained idle.

The unequal distribution of wealth have caused the haves and the do-not-haves to form groupings. We could have anticipated this for in the process of buying and selling, bartering and exchanging one thing for another the primary producing countries have been receiving the short end of the stick. "Nobody ever saw a dog make a fair and deliberate exchange of one bone for another bone with another dog", so wrote Adam Smith in The Wealth of Nations about the propensity of human nature in the operations of a market society. The sum of the GNPs of the nine countries in the EEC with a population size almost similar to that of the ASEAN group of five countries

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was 17 times more than that of ASEAN in 1975. The Group of 77 now expanded to 115 countries has a population which is 2.6 times greater than that in the 24-member countries of the OECD but the distribution of wealth is 4.7 times in favour of the OECD. The Comecon Association of nine countries have a total GNP that is only 1.2 times that of the Group of 77 countries but the Group of 77 comes out poorer as they have five times more population. A common feature between the OECD and Comecon Countries is their greater acquisition of technology and a smaller population size.

Burdened as they are with a large population it is not surprising that one-third of the total imports of those developing countries which are non-oil producers consist of primary commodities and of these two-thirds are essential foodstuffs. What is surprising is that these foodstuffs are chiefly imported from the industrial countries. This enhanced supremacy of the industrial countries has been due to the application of technological development and genetic engineering in agriculture. Nineteen seventy-nine has been designated by the WHO as the Year of the Child. We applaud the WHO and UNICEF for their concern over malnutrition among children. What is dismaying is that subscribing to rhetoric is no substitute for stopping the scandalous wastefulness displayed in the EEC's approach to the economics of meat and dairy products. Because of the EEC's growing mountain of butter, milk is thrown away. Increased productivity has always been preached as a solution to price inflation but when hens lay too many eggs they are swiftly converted into fertilizer.

Developing countries are not homogenous. Some are small nations with little or no natural resource, others are large and resource-endowed. As each nation has its own unique problems discussions on the transfer of appropriate technology cannot be generalized. However, many share a common problem that growing populations create pressures for employment, food, housing, health services and education. Between 1970-75 a number of countries experienced real GNP per capita growth rates that were either negative or smaller than their population growth rates. This meant a distribution of poverty. Contraceptive pills and intrauterine devices which come in as many shapes as there are uteri

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are the products of western technology. Sterilisation is the simplest biological technique for population control but whatever method is used success can only be achieved through mass education and political will. China with a population of over 800 million reduced its annual natural increase to 1.7 per cent while average annual GNP per capita grew by 5.3 per cent. Developing countries at least owe this to themselves in their first step towards development.

In those developing countries where 80 per cent of the population live in rural areas it would seem that a logical strategy for their development should be based on improving their capacity to produce more food and relieve their dependence on imported foodstuffs. It means effective use of land and water resource, plant and animal protection and provision of primary health facilities besides eradication of communicable diseases which are endemic to the area. An agro-industrial complex in the countryside will inhibit the migration to the cities which are already besieged by squatters and the unemployed. It is not too difficult to apply science and technology for development as the basic technology already exists and can be modified to local conditions. The development process is interwoven with politics, attitudes to life and work, the social and psychological distance between the elite and the masses as Gunner Myrdal has pointed in his Asian Drama. These are parameters which bear an influence on the choice of "appropriate" technology to achieve objectives.

The growing disparity in commerce and trade between the developed and developing countries have stimulated the alignment of developing countries into the Group of 77. It is the heavy dependance of the developed countries on imports of energy and raw materials from the developing countries that has brought about the so-called North-South dialogue for the creation of a just and new economic order. The invisible hands that move market forces have become very visible as the developed countries struggling with high inflation impose protectionist restraints on the entry of goods and services from the developing countries into their markets. Indolence in the developing countries means starvation but indolence in the developed countries has a premium paid for by inflationary social security schemes. We are truly living in an unequal world.